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MATERNAL NURSING

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In times that we are fond of considering as less enlightened than our own, the importance of maternal nursing of infants was stressed in the literature, and apparently with some reason. As late as 1879 J. Lewis Smith, in his "Treatise on the Diseases of Infancy and Childhood" remarked, no doubt with truth at that time, that artificial feeding generally ends in death. A considerable amount of the instruction given to those caring for children in early days was put into the form of verse and many of these pediatric poems have been collected by Ruhräh in "Pediatrics of the Past." Thus we find the following sage advice quoted from Paedotrophia, published by Sainte-Marthe in 1584.

"If Health and Strength permit thee, don't refuse
The Child Thy Nipple; nor another's use:
If to the Babe thou dost thy own deny,
Ill, will a venal Pap its Wants supply;
Ill, will the Bus'ness by that Nurse be done,
Who for another's child neglects her own."

The author continues, however:

"Yet, if thou'rt sickly, if thy spirits fail,
If the Child's touch'd with any catching Ail,
This Duty, whether hated or desir'd,
Ceases, and 'tis no more of thee required.
Then not to Suckle, is not to neglect,
But chuse a Nurse, and I'll thy Choice direct."

Maternal nursing, with the advent of more scientific, or at least of safer methods of artificial feeding, gradually came into more and more neglect, and probably reached its lowest ebb during the last two or three decades. The time-honored pendulum is now swinging in the other direction and we are coming to realize that although we may aid Nature and occasionally substitute for her, we cannot always improve upon her methods.

Two extreme views hold in regard to breast feeding, as indeed in all human activities. On the one hand we have the idea, favored by some physicians, that breast feeding is an unnecessary nuisance, and its abandonment is looked upon with complacence. This attitude may be at times positive, at times negative, but where active encouragement is so often needed its lack alone may be the determining factor in favor of an abandonment of the maternal duty. These individuals apparently regard pediatrics as a sort of ideal infant commissary where suitable rations are issued at will and no questions asked. The pediatrist himself must sometimes blush with embarrassment at finding himself on this pedestal to which he has been so unceremoniously hoisted.

We have on the other hand the overzealous exponent of the naturalistic method, who believes that breast milk is a sort of divine manna in the wilderness; a panacea for all infant ills—which it may be, but the evidence is not yet conclusive. These advisers will husband and seek to conserve a few ounces of breast milk a day as a drowning man grasps at a straw, no matter what effort it may cost the tired mother to produce it.

Statistics pointing to the supreme value of maternal nursing are current and are unquestionably correct, but like all statistics they are subject to misinterpretation. Thus, while we know that six times as many infants who die between the ages of two weeks and one year are bottle fed as are breast fed, it must not be forgotten that these figures are drawn largely from the poorer and more ignorant classes of society, among whom it is obvious that breast milk represents a comparatively sterile, easily available and particularly suitable source of nourishment for infants, and that artificial food generally represents a carelessly and ignorantly prepared and often grossly contaminated supply. As between breast milk and an artificial food intelligently prescribed and carefully prepared and administered, under cleanly conditions, I firmly believe that *in most instances* the difference is very slight, with the balance *in most instances* in favor of human milk.

Certain arguments raised in favor of breast feeding must be taken with a large grain of salt, for they have either been proven invalid or there is insufficient evidence to support their validity. Thus we know that breast milk, like cow's milk, cannot be relied upon as a source of either the anti-scorbutic vitamin or the anti-rachitic factor, and what little evidence is available is against the theory of immunity transference, either through milk or colostrum. It has been shown that in goats and cows, with a complex placental structure, placental transmission

of immune substances does not occur, and the colostrum is the main agent for their transmission. In rodents and man, with a simple placental structure, placental transmission has been demonstrated, and the investigations of Kuttner and Ratner indicate that colostrum has little significance[1].

Breast feeding is unquestionably the ideal type of infant feeding in practically all cases, because it is economical, peculiarly suitable to the infant's digestive tract, and above all, safe. Except where definite contraindications to nursing exist its employment should be seriously recommended and a distinct effort should be made to promote it, and this can best be accomplished by intelligent advice as to the proper means of establishing and maintaining a sufficient supply. Where contraindications are definite or where a conscientious effort has failed, proper substitutes may be resorted to with perfect safety in the vast majority of instances.

Even discounting the rather extravagant claims of those who believe that practically one hundred per cent of mothers are able to nurse their infants, if properly instructed, it must be admitted that the number who do so nurse fall far below the possible ratio. If proper measures are taken; if intelligent advice is given to eager and coöperative mothers, it can be stated with assurance that the chances for success should be in the neighborhood of 80 per cent. Richardson[2], in reporting on a breast feeding campaign undertaken in 1923 in Nassau County, New York, found that the percentage of breast feeding for each month of life ranged from 92.1 per cent in the first month, to 66.3 per cent in the seventh, and that 82.6 per cent of the mothers who coöperated in the demonstration nursed their infants for three months. Moreover, the infant mortality rate of the 2,815 studied was 49 per thousand against 64 per thousand for the whole county in the same year. Every physician should, in his practice, be able to attain as least as good results.

There are two inexcusable causes of failure to nurse; unwillingness on the part of the mother and ignorance or lack of interest on the part of the physician. Other causes which militate against successful nursing are insufficient glandular tissue, depressed nipples, cracked nipples and breast infections, and on the part of the infant hare lip, cleft palate and weakness, congenital or due to prematurity. Where glandular tissue is insufficient for milk secretion no remedy is to be found. In cases where the nipples are depressed the infant may nurse with the shield and the milk should be manually expressed. Cracked nipples, and in most cases breast infection should be causes for only temporary abandonment of nursing, and it must be remembered that the milk may be brought back weeks after secretion has apparently ceased.

Lack of ability to nurse on the part of the infant may furnish sufficient reason for taking him off the breast, but not for ceasing to provide him with maternal breast milk, for this may be expressed manually and the supply kept up for months. A frequent cause for the abandonment of nursing is simple nervousness on the part of mothers who may be perfectly capable physically.

Active tuberculosis constitutes a true and absolute contraindication to nursing. Epilepsy and insanity, especially if the mother is not under constant supervision; acute or very severe nephritis, and severe acute or chronic illnesses may also be taken as contraindications, although in these the course of action should be decided on the merits of individual cases. Supervening pregnancy should not be considered as a contraindication unless it becomes apparent that the infant is being insufficiently nourished. Menstruation, although it may affect the milk temporarily, is not an indication for weaning. Infants definitely should nurse from syphilitic mothers who are under treatment, in diabetes, and during the course of ordinary infections in the mothers. In such diseases as scarlet fever and measles the infant may be considered as protected by his natural immunity. Diphtheria in the mother should be considered as an indication for temporary cessation of nursing if the infant has a positive Schick test. Occasionally it will become apparent that an individual milk supply does not and cannot be made to agree with an infant, in which case weaning is justified.

There are two essentials for successful breast feeding—absolute coöperation on the part of the mother, and regular and complete emptying of the breasts, and while the latter can generally be accomplished satisfactorily by the robust infant, in many cases complete emptying must be aided by other means. In performing this the commonly employed hand breast pump is probably least effective; the expensive electric pump now coming into vogue in many institutions is very useful; manual expression, or stripping by hand, available for all and practiced by so few is the most effective. Feeble infants or infants disinclined to take the breast should always be assisted and encouraged by manual expression during the nursing period and the secretion of milk should be increased by complete emptying of the breasts after the nursing is over.

This method of increasing the milk supply, extensively used in the West, has been little resorted to in this section of the country and its employment should be encouraged. The technique is described by Moore[3] as follows: "First: with the thumb above and finger below, about one inch from the nipple, press deeply and firmly backward into the tissue of the breast; the "deep" motion. Second: maintaining this pressure, with the same fingers compress the breast behind the base of the nipple: the "together"

motion. This forces the milk out of the little pockets in which it accumulates. The fingers do not move forward nor change this position on the skin during the process. Only one hand is required for expression; the other holds the glass which receives the milk. With a little practice this motion can be repeated fifty to one hundred times a minute. If manual expression is properly performed the milk comes in *streams*, not in *drops*. When one can project the milk streams a distance of three feet from the nipple he has properly mastered the technique."

Under ideal conditions the infant should be fed at the breast for nine months, with the addition of cereals and green vegetables for the last two or three. Any possible duration, however, may be considered of value, for the younger the infant the greater is the need for a suitable food supply. Even when the supply of milk is abundant and nursing is thoroughly satisfactory it is wise to start giving a supplementary bottle at three or four months in order to give the mother opportunity for recreation and to accustom the child to the use of the bottle; this may render the act of weaning, when it becomes a necessity, infinitely more easy to perform. The healthy infant of normal birth weight should be put to the breast within six to twelve hours after birth for a short period, and thereafter at regular intervals, regardless of whether or not there is anything for him to obtain. He is thus early accustomed to take the breast and the stimulation of the sucking may somewhat hasten the secretion of the milk. Many, perhaps most infants, will easily adapt themselves from birth to a four hourly schedule of nursing with the late night feeding omitted. Five feedings a day should be considered sufficient in most instances; not at all a novel procedure, for the conservative reader is again referred to Ruhräh who quotes the following, written by William Cadogan in 1750.

"I would advise every Mother that can, for her own sake, as well as her Child's, to suckle it. If she be a healthy Woman, it will confirm her health; if weakly, in most cases it will restore her. It need be no confinement to her, or abridgement of her time; four times in four and twenty hours will be often enough to give it suck; letting it have as much as it will take out of both breasts at each time."

The duration of individual nursings has been arbitrarily set by most writers at fifteen to twenty minutes, even while they acknowledge that most of the meal is obtained during the first few minutes of this time. Smith and Merritt[4], by fractional weighings, have shown that from 40 to 60 per cent of the milk is obtained in the first two minutes and from 60 to 85 per cent in the first four. After eight minutes very few babies get any milk whatever. The rate from the second breast is similar to that from the first. It is obvious, then, that mothers who complain that their babies require forty minutes or more to a meal are wasting a great deal of their own time and their babies'. If the babies swallow at all after the first few minutes they are probably getting only air which will manifest itself later as colic or flatulence. Eight minutes on each breast should be considered ample, and after the nursing the infant should be picked up and patted on the back until he belches up the air that has been retained in his stomach.

Since breast milk cannot be relied upon as an adequate source of the accessory substances of nutrition, orange juice and cod liver oil should be started with the breast fed as with the bottle fed baby during the first two months of life, particularly if these should be in the fall or winter.

It is generally considered that a nursing infant should receive approximately three ounces of milk for each pound of body weight in the twenty-four hours in order to maintain its caloric, protein and fluid requirements. An infant receiving this amount needs no additional water although water may be offered to it once or twice a day as a precautionary measure. Infants who are satisfied and who are gaining satisfactorily in weight—from one and a half to two pounds a month—require little more attention to their diet. If the weight gain is insufficient or if there is evidence of hunger, accurate weights should be taken before and after feeding to determine the actual amount being taken. As individual feedings may vary greatly in amount these weighings should be continued for one or two complete days. If the amount taken from the breast is insufficient for the requirements and cannot be increased by conscientious stripping, complemental feedings should be introduced, either after each feeding or after those which are deficient. In instituting complemental feedings it must be borne in mind that milk comes more easily from a bottle than from the breast and that a wise baby soon learns to wait for the supply that requires less work to obtain. As a general statement it may be said that beginning complemental feedings is the first step towards complete weaning.

Entirely out of the class of complementary feeding, if care is taken, is the temporary offering of a simple formula during the first two or three days of life before the milk comes in sufficient quantity to provide adequate nourishment. Although by no means a necessity this may be considered as a valuable method of preventing initial weight loss. Less effective is the feeding of a dilute sugar solution as is ordinarily practised. Care must be taken lest the infant become converted to the bottle before he is accustomed to the breast, and as soon as the breast supply is sufficient to nourish him the bottle must be firmly withheld.

It is not my purpose to go into the disorders

of alimentation associated with breast feeding except to say that underfeeding with its accompanying vicious cycle of wakefulness, fatigue, nervousness, colic, vomiting and frequently diarrhoea is much more common than overfeeding or an improperly balanced milk. Underfeeding must be met by an increase of supply or by the addition of complemental feedings; overfeeding is easily corrected by shortening the feeding time and withdrawing the nipple at frequent intervals. Much more difficult to control are the digestive disturbances due to environmental conditions, under which the infant is over or insufficiently wrapped, or over-stimulated by the presence of an excitable mother or a family that does not appreciate the baby's right to sufficient rest.

It is possible somewhat to modify the milk by changes in the mother's regime or diet; the fat content may be increased or lessened by regulation of diet, but in the main a most abundant and properly balanced milk is produced by a normal, easily digested and properly balanced diet with sufficient mineral intake, and combined with sufficient exercise short of fatigue, and freedom from worry. It is trite to say that maternal nursing is a physiological function. The social exigencies and influences of civilized life are not necessarily conducive to proper physiological functioning.

Simple cleanliness consisting in washing with plain water before nursing should comprise all the care the breasts need under normal conditions. Over attention may result in cracked nipples and breast infections. Lead encephalitis in the infant has been known to result from the use of lead nipple shields, although such an occurrence must be extremely rare and could not happen with ordinary care.

Weaning of the child is usually quite an automatic procedure, rendered imperative as well as simple by the failure of the milk. When weaning is desirable or necessary in the presence of an abundant milk supply, it can best be accomplished by the gradual substitution of bottle feedings for breast feedings, over a period of several days. Where the infant has been unaccustomed to the bottle it may be refused for a considerable period of time, and virtual starvation is necessary before he is willing to accept it.

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CHOLECYSTOGRAPHY*

BY FREDERICK W. O'BRIEN, M.D.

Some ten years ago in the Boston Medical and Surgical Journal[1], I reviewed much of the extant literature on the diagnosis of gallstones by the Roentgen ray. It seemed then, with the new Coolidge tube, intensifying screens, and heavy duty transformers (allowing a perfection of technique that made some roentgenologists feel that gallstones could be demonstrated whenever present), a far cry to the first X-ray plates of gallstones shown by Karl Beck in New York City in 1899.

During these past ten years, from time to time, further refinements in apparatus have been given us, such as the fine focus X-ray tube, double intensifying screens, duplitized films, and, notably, the Potter Bucky diaphragm, an instrument which does away, in great part, with secondary radiation, so bringing out into relief the X-ray image on the photographic emulsion.

It may clarify the subject if I explain in not too detailed a way the reasons for some of the X-ray difficulties heretofore in the examination of the gall bladder region.

Substances opaque to ordinary light are translucent to X-radiation, but the more opaque a substance is to X-rays, the better its relative definition, the more clearly it is seen on the photographic film in relation to its surroundings.

The gall bladder is a muscular sac in juxtaposition to the liver. It is of low atomic weight, and hence is readily penetrated by X-rays. When the gall bladder contained stones, one had some chance of demonstrating them. I say some chance because there are several types of gallstones. A so-called mixed gallstone, the type commonly found in the gall bladder, is made up in large part of cholesterin, which is very soft and easily penetrated by X-rays, so that no record of the same is likely to be left behind on the photographic film.

Gallstones made up almost entirely of calcium are demonstrated very readily by X-ray but this type is in the minority.

When I tell you that a patient's failure to hold the breath even for a moment during the X-ray examination can blot out all evidence of a stone, it may aid you to grasp the technical difficulties in the matter.

Improvement in apparatus was followed by improvement in technical results, so that many roentgenologists came to believe that the gall bladder itself could be shown on the X-ray film

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whether it contained stones or not. How inaccurate this was now is accepted, not without chagrin.

Usually the patient was given an opaque meal to obtain a silhouette of the stomach and bowels with a view of demonstrating so-called indirect signs of pressure or adhesions from a sick gall bladder.

It would now appear, however, that all data so obtained must be rechecked by the method which I am about to describe to you, a recent discovery, whereby we actually show the gall bladder and may delineate even the so-called soft type of gallstones.

Visualization by a dye of the gall bladder or cholecystotography, as it is called, was first described by Drs. E. A. Graham and Warren Cole of St. Louis in a communication[2] from the Department of Roentgenology of Washington University published in February 1924. They reported the fact that the calcium salt of tetrabromphenolphthalein when injected intravenously permits the visualization of the gall bladder by the Roentgen ray. Because of a desire to get away from the unpleasant effects of the injection of this salt, they later[3] recommended the use of the sodium salt of tetrabromphenolphthalein, after having experimented with and rejected many others of the group of hallogenphenolphthaleins.

Whitaker and Milliken[4] of the Harvard Medical School, in reviewing the work of Graham and Cole, discovered that one of the salts rejected by them because of its toxicity, namely the sodium salt of tetraiodophenolphthalein, gave a much denser X-ray shadow because of its high atomic weight than sodium tetrabromphenolphthalein. The atomic weight of bromin is 80, while that of iodine is 127. You will recall that earlier I made reference to the fact that the higher the atomic weight of a substance the more opaque it is to X-rays. In the matter of these dyes, it would appear that the sodium tetraiodophenolphthalein salt was at least fifty per cent. more opaque than the bromin.

Whitaker and Milliken found there was no appreciable difference in the toxicity of the bromin and iodine salts. In practice, nearly twice as much of the bromin salt as the iodine salt was required to obtain a shadow of the gall bladder. Because of this difference, there appeared to be a wide margin of safety in favor of the sodium tetraiodophenolphthalein over the analogous bromin compound.

The experimental studies of all these investigators were on dogs. In passing, may I call your attention to the beneficial results of this work as another demonstration in itself in favor of animal experimentation, because of the good accruing to humans through it.

At the start, these salts were given intravenously. Many patients reacted very severely to them so much so that it meant hospitalization for the patients and very careful supervision during the injection of the dye. These bad reactions were particularly seen in patients who had the calcium and sodium derivatives of bromphenolphthalein. Milliken and Whitaker[5] found the reactions to the sodium tetraiodophenolphthalein much less marked, and in their first series of cases had only four reactions severe enough to cause headaches or vomiting.

Because of the somewhat complicated technique of administration and the tendency to reaction following it, they then attempted the oral administration of sodium tetraiodophenolphthalein, following an interesting observation made by Dr. Merrill Sosman, the roentgenologist at the Peter Bent Brigham Hospital, who, in doing a routine gastrointestinal series, following cholecystography by intravenous injection, noticed that the gall bladder shadow which was absent at twenty-four hours, had reappeared at the end of seventy-two hours, which indicated that after the salt had been excreted by the biliary system, some of it was absorbed by the alimentary canal, and again excreted in the bile, thus allowing a second cholecystogram seventy-two hours after the first. They then prescribed the salt in the form of pills coated with salol and syrup of tolu[6], a substance which is not dissolved in the stomach, and found that cholecystograms were produced in 93 per cent. of normal subjects by this method, its advantages being, it relieves many patients of hospitalization, necessary for the intravenous method, and that it causes them very little inconvenience and few unpleasant symptoms.

Graham, Cole and Copher, in a resumé of their work, presented before the American Roentgen Ray Society in Washington in September, 1925, stated that the value of cholecystography lies not only in its ability to recognize gross pathological alterations of the biliary tract but also in the fact that it serves as a rather precise functional test to the gall bladder; that the theory upon which the procedure is based is that if any substance containing either a metal or atoms of bromin or iodine could reach the gall bladder in sufficient concentration, then that organ would be made opaque to the Roentgen ray. To be practical the substance must be one that can be given either by the alimentary canal or by injection, be relatively non-toxic and sufficiently soluble to avoid the necessity of giving large volumes of fluid; in any case, presumably a substance which is excreted by the liver and carried to the gall bladder in the bile. Moreover, the ability of the gall bladder to concentrate its contained bile would indicate that sufficient time must elapse before a shadow of maximal density would occur. Reasoning from these premises,

the conclusion would have to be drawn that the shadow of the sharpest contrast would be obtained in normal individuals.

Similarly also, they say no shadow would be expected to appear if the liver were unable to excrete the substance in sufficient amount, if the cystic ducts were occluded, or if the function of the gall bladder were sufficiently impaired to prevent the concentration of the material.

For this purpose, the most useful substance seems to be the sodium salt of tetraiodophenolphthalein. It was the first substance that they used in 1923. It happened that their first preparation contained toxic impurities which resulted in the death of some of their animals. Thinking that the toxic results were due in part at least to inevitable decomposition products of the iodine compound, they decided to try the tetrabrom product instead. They later discovered that their former bad results were in large part evidently due to impurities which could be eliminated.

The sodium salt of both the tetrabrom and tetraiodophenolphthalein is a blue crystalline compound which is readily soluble in water. Prolonged exposure of even the dry salt to the air and light causes it to fade and increases its toxicity. It should therefore be kept in brown bottles.

Ottenberg and Abramson[7] tested on rabbits the toxicity of tetrachlorphenolphthalein and tetrabromphenolphthalein. They found a peculiar feature was the lack of gradation between toxic and non-toxic doses, either the animals showed almost no lesions or the lesions were extreme. The doses needed to produce severe symptom and liver lesions, however, were enormously larger than those used in the tetrachlorphenolphthalein test for liver function, but while the amount of tetrabromphenolphthalein used in gall bladder visualization is safely below the toxic dose, the margin is not so large and suggests the necessity for caution in cases in which the liver parenchyma is already damaged by disease.

Repeated examinations by Graham, Cole and Copher of small pieces of the liver of both the dog and the human after administration of their doses failed to reveal any abnormality.

Fairly rapid intravenous injections of the sodium salt of either substance induces a sharp, transient fall of blood pressure in the dog. There have been no changes in blood pressure in the majority of their clinical cases.

Carmen of the Mayo Clinic[8] speaking of the intravenous method of injection of the dye, stated that the technique was necessarily exacting. Phlebitis may result from injection into a vein of small calibre, such as the median cephalic. If the needle fails to enter the vein and dye is injected into the tissues, local necrosis and sloughing may occur. Systemic reactions from the dye are common and vary from a slight malaise to most profound shock. Reactions are so severe in certain conditions that the method is contraindicated. These conditions, he stated to include obstruction of the common duct, extensive hepatic damage, marked diabetes, hyperthyroidism, arteriosclerosis, hypertension and cardiac diseases, especially that attended with auricular fibrilation.

Graham, Cole and Copher state that by using the sodium salt of tetraiodophenolphthalein, toxic reactions have been practically eliminated, but advise against the injection of elderly patients with low blood pressures or with bad cardiac conditions.

Sosman, Whitaker and Edson declare that no contraindications have been encountered so far for either the intravenous or oral method. The tests have been successfully employed by them in patients with jaundice, cirrhosis of the liver, hemochromatosis, chronic passive congestion, nephritis, hypertension, chronic myocarditis, angina pectoris and brain tumor.

The technique as employed by Graham and Sosman differs materially, based apparently on different physiological concepts of gall bladder function.

In using either the tetraiodo or tetrabromphenolphthalein, it is essential that digestion should not be in progress at the time of injection. Otherwise, no shadow may be produced, even in a person with a normal gall bladder. In order to obtain a shadow of maximal intensity, it is necessary to have maximal secretion into the bile and maximal concentration of the substance within the gall bladder. If food is present in the duodenum, evidence seems to indicate that sufficient bile is poured into the intestine to prevent the maximal entrance or concentration of the dye in the gall bladder.

Accordingly, the routine procedure which we now carry out for clinical use, say Graham, Cole and Copher[9], is as follows:

In the case of tetraiodophenolphthalein 3.5 gm. of the sodium salt is dissolved in 28 or 30 cc. of freshly distilled water for an individual weighing one hundred and twenty-five pounds or more. The solution is filtered through a fine filter paper, and sterilized in a boiling water bath for fifteen minutes. The solution is given intravenously in two doses one-half hour before breakfast between 7:30 and 9:00 A.M. Care should be taken not to allow extravasation outside the vein during the injection. Solutions of the tetraiodophenolphthalein made with this dilution may produce induration but in our experience, no sloughing of tissue has ever occurred. When the sodium salt of tetrabromphenolphthalein is used, a dose of 4.5 gm. is dissolved in from 35 to 40 cc. of freshly distilled water and injected as described above.

Certain orders for the patient are essential.

Breakfast should be omitted, lunch should be omitted, but the patient may have a glass of milk. Proteins should be omitted at the evening meal. Water is allowed ad libitum. Alkalinization of the stomach contents by frequent doses of sodium bicarbonate advised by mouth is helpful. The rationale of the latter procedure is explained in a recent article by Cole, who found experimentally on dogs, that the flow of bile into the intestine through the relaxation of the sphincter of Oddi is prevented or much diminished by keeping the contents of the stomach alkaline. This probably tends to promote the concentration of bile in the gall bladder. Roentgenograms are taken in series at four, eight, twenty-four and thirty-two hours after injection.

If the technique described above has been carried out, a normal gall bladder will show the following reactions:

Usually at about the fourth to the seventh hour after the injection, a faint but definite outline of the gall bladder appears, which is seen to have the contour of the normally shaped organ, but to be somewhat larger than normal gall bladders usually seen at laparotomy. At the end of twenty-four hours, the shadow is much more distinct but contracted down to about one-half its earlier size. From then on to about the forty-eighth hour, the shadow diminishes in size and fades gradually.

Abnormalities reveal themselves in various ways. A failure to obtain any shadow after carefully following the recommended technique has invariably indicated definite pathology of the biliary tract. It is conceivable, however, that in rare instances, in a very serious disturbance of the hepatic function, an insufficient amount of the substance might be secreted to produce a shadow even without any appreciable alteration of the gall bladder, but we have not yet encountered this difficulty.

Abnormalities of less degree have showed themselves by such phenomena as late appearance of a shadow, faintness of shadow, failure to diminish in size, distortion of outline, irregular mottling, etc.

As experience with the method increases, it becomes more and more evident that it is an index of function of the gall bladder rather than one which shows sharply distinct pathological lesions.

For example, two such different pathological conditions as obstruction of the cystic duct and fibroid gall bladder without obstruction of the cystic duct will both usually result in a failure to obtain a shadow. The reason for this lies in the fact that although in the first instance the substance has not been able to enter the gall bladder, in the second instance, the gall bladder has not been able to exercise its normal function of concentrating the bile. As a result of the obliteration of lymphatic vessels of the wall of the gall bladder by inflammation, the normal ability to concentrate the bile, as demonstrated by Rous and MacMaster, becomes seriously impaired. Gallstones have sometimes been visualized by appearing as negative shadows in cholecystograms. More often, however, we have failed to visualize the stones, which were later proven at operation to be present, because usually a cholecystitis severe enough to be accompanied by stones fails to respond by any shadow of the gall bladder at all, but the method has often proved useful as distinguishing between renal stones and gallstones. They report a series of 261 individuals studied by the intravenous method. Of this number, 80 patients came to operation. In that series the cholecystographic diagnosis was found correct in 96.5 per cent. of cases.

The intravenous dose of the salt as employed by Sosman, Whitaker and Edson[10] namely, sodium tetraiodophenolphthalein, is 0.4 gm. per kilogram of body weight given in a single injection as a 2 per cent. solution at body temperature, late at night, and the first films are made the following morning, ten hours later.

The oral dose is given as "enteric coated pills," using one 5 gr. pill for each 10 to 12 pounds of body weight, four at a time at half hour intervals after the evening meal, and the first films are made the following morning at fifteen hours. With each method, the patient is fasting.

Sosman, Whitaker and Edson used the intravenous method on 120 patients. The intravenous method gave accurate results in 93.5 per cent. of the cases. The oral method has been employed in 243 cases to date (Sept. 1). In this group, 95.2 per cent. of the cases explored surgically had received a correct diagnosis by oral cholecystography, although on a small group of patients, on whom both methods were done, Sosman's conclusion is that the oral method is only 70 per cent. as accurate as the intravenous method. If the shadow of the gall bladder, they say, is of standard density, regular in outline, homogeneous and decreases in size after protein or fat food, it may be relied upon by either method to denote a normal organ. If definite and persistent negative shadows are found, the gall bladder almost certainly contains stones. If the shadow is faint or absent by the oral method, a supposition of abnormality must be confirmed or disproved by the intravenous method, and if by the intravenous method, no shadow is obtained, an additional diagnosis of blocked cystic duct may reasonably be made provided the salt is visible in the colon. Faintness of shadow as an evidence of impaired function is reliable only with

the intravenous method because of the uncertainty of absorption of the salts from the intestinal tract when given by mouth.

Variations in the response to food and rate of emptying occur with fair frequency. Their interpretation in terms of pathology is difficult, but a prompt response is of value in determining the normal. The significance of delay in emptying or a weak response to stimulation by food is yet to be determined.

Graham's original dicta stated that patients should not be given any food during the test, and in the Sosman series, a patient who was inadvertently given a full meal showed a prompt decrease in the size of the gall bladder shadow. This seemed to be good evidence that the gall bladder had emptied into the duodenum, which, if true, would be an important finding, inasmuch as several observers have stated that the gall bladder does not empty through the cystic duct but rather by absorption. Experiments were then made by Sosman, Whitaker and Edson to determine what property or element of food caused this reduction of the shadow. Psychic tests, that is the sight, smell or taste of food, had no effect, but ingestion of food rich in fat was nearly always followed by a decrease in the size of the shadow with eventual disappearance in three to six hours. It was found that a carbohydrate meal could be given without any effect; that proteins (lean beefsteak) and peptone (Witte's peptone) caused a moderate decrease in the size of the shadow; and that fats, such as butter, cream or egg yolks, gave a marked response. Raw egg albumin caused no decrease in the size of the shadow, but partly coagulated albumin (soft-boiled) produced slight reduction. Pure olive

FIG. I. Showing density of shadow cast by dye-filled gall bladder when dye is administered by mouth.

oil in man had no definite power to empty the gall bladder but in dogs, its ingestion was followed by a good response.

Olive oil treated with the Alpine lamp for one hour gave only a slightly greater response than raw olive oil, probably within the limits of experimental error. Castor oil produced no effect.

pine sulphate by hyperdermic injection seemed to have a slight inhibitory effect on the response to food, but there was no direct action on the gall bladder. Physostigmin, pilocarpin, pituitrin and adrenalin given by hyperdermic injection, dilute hydrochloric acid administered orally and by duodenal tube, and nitroglycerin, meat extracts, ginger, starch, sugar, glucose and

FIG. II. Same gall bladder showing contraction and emptying immediately following fat meal.

With Dr. Cannon's help, these investigators found that there was no constant reaction to drugs, with the exception possibly of magnesium sulphate by duodenal tube, which Silverman and Menville had previously shown caused a moderate decrease in size, comparable to that obtained by proteins and peptones orally. Sodium bicarbonate by mouth was followed by a slight increase in the size of the gall bladder shadow with a decrease in its density. Atro-

various other substances given by mouth had no constant effect on either the size, or the density of the gall bladder.

In dogs, however, a large dose of sodium taurocholate, which according to Whipple is the only effective cholagogue, was followed by an increase in size without a decrease in density of the gall bladder shadow. Alcohol, as a drug, produced no constant effect on the gall bladder shadow.

Mechanical factors were then considered in an attempt to empty the gall bladder by increasing intra-abdominal pressure. A series of exercises involving strenuous use of the abdominal muscles were prescribed for several of the students. Again no effect on the gall bladder shadow was noted. Likewise, forced respiration, heat and cold, and direct pressure had no effect.

The explanation of these signs is difficult. It seems clear, they state, that the gall bladder empties to a degree which depends on the stimulus and that intra-abdominal pressure alone has no demonstrable part in the emptying.

Likewise, the drugs, so far as observed by them have no constant effect, an observation which seems to prove that a nervous reflex is not a factor. Furthermore, completely denervated gall bladders in dogs have shown, after the recovery of the animals from the operation, a normal response to the ingestion of fat. Vagus stimulation of varied strength likewise failed to show any change in the size of the gall bladder shadow, and produced violent intestinal peristalsis.

Direct stimulation of the ampulla of Vater by food was considered a factor in the emptying of the gall bladder until it was found that maximum contraction was obtained in each of two subjects and three dogs who had functioning gastro-jejunostomies, one of the subjects and all of the dogs having had a transection of the pylorus, effectively short-circuiting the duodenum.

A circulating hormone as the cause of emptying was then considered, and secretin, freed from its associated depressive substance, was used on four dogs. In three of them, a questionable decrease in the size of the gall bladder shadow was noted. In the fourth, no effect was observed, after repeated intravenous injections to the point of marked salivation.

In short, they found no rational explanation of the mechanism of response. The important question of active contraction versus passive emptyings is also unsettled. Nor have they been able to throw any light on an observation noted by many, that with the decrease in the size of the gall bladder shadow after food, there is an increase in the density out of proportion to the time factor and in spite of the loss of considerable of the shadow-casting substance.

Two important facts in relation to the production of a normal shadow have been established, they believe: viz.

(a) That an intact sphincter of Oddi is necessary to obtain a normal cholecystogram. Cannulas were put through the papilla, sewed in place and after recovery of the animal from the operation, cholecystograms were attempted by the usual technique, but normal shadows could not be obtained. Very small shadows, suggesting collapsed gall bladders were seen in three dogs and no shadows were obtained in four others.

(b) That the normal mucosa is important, for no shadow could be obtained for several days after the gall bladder was curetted.

The findings herein reported, Sosman, Whitaker and Edson conclude, may serve to explain why patients with gall bladders and those especially with calculi avoid fats and if the apparent relaxation of the gall bladder after sodium bicarbonate is to be found constant, why they obtain relief from the digestion of alkaline substances.

My own experience has been with the oral administration of sodium tetraiodophenolphthalein.

Early during the experimental work, I was able to obtain some of the pills from Dr. Sosman. I have used the oral method in forty-five private patients. In some of the early cases, I had very severe reactions following the administration of the dye. In one case, a doctor's wife suffered nausea, vomiting and diarrhea over a period of six hours, almost to complete collapse. The majority of my office cases have had merely mild symptoms of nausea; one or two have vomited; a few have had diarrhea. I know of one death following the oral administration of the dye. The autopsy report was abscess of liver. Whether or not this was a coincidence remains to be determined. Certain it is one should endeavor to use a drug of only the highest purity.

The oral method would seem to be the one of choice for office patients; the intravenous method only to be used to check negative results with the oral method; this to be done in a hospital where surgical emergencies following intravenous injection may appropriately be treated.

Thus far, at any rate, cholecystography has helped us get rid of some notions, clarify others and stir up the hope of learning much more about the gall bladder.

Our knowledge to date would lead us to say that a gall bladder that fills with the dye and empties promptly on response to a fat meal is within normal limits, and one which does not fill with the dye is pathological, bearing in mind the reservation that goes with negative tests by the oral method.

For some years now, X-ray men have not hesitated to talk about the direct visualization of the gall bladder. It was not always clear whether the shadow pointed out was a pole of a kidney, a small lobe of the liver, a portion of the duodenum, or the antrum of the stomach or the gall bladder. Cholecystography definitely locates the gall bladder for us. This may have great clinical significance, especially in relation-

ship to the site of a patient's pain. The dye-filled gall bladder may be differentiated from the kidney, the duodenum, the liver, the appendix, the ovary and other localized sites of pain in the abdomen.

I feel that it is within the range of probability that except for the work of Whitaker, the test might have been lost as one of general usefulness to the profession.

In a series of 500 cases examined by Sidney Lange of Cincinnati by cholecystography, he found the gall bladder in 75 per cent. of the cases to be outside of its so-called anatomical site.

If in my review of the diagnosis of gall stones by X-ray ten years ago, I thought we had made progress, now I must chronicle a new era, for nothing since the use of the opaque meal in the study of the gastro-intestinal tract has been comparable to the discovery of this dye.

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EXPERIMENTAL STUDIES ON OVARIAN FUNCTION

I. The Relation of Blood Supply to Ovarian Function in the Rabbit*

BY DONALD MACOMBER, M.D., F.A.C.S.

THE purpose of the following research was originally to find out, if possible, the action of the sympathetic nervous system upon the function of the ovary. It had been reported in the literature[1] that section of the sympathetic fibres and removal of the ganglia in the male dog caused degeneration of the testis, and it seemed worth while to find out the effect upon the ovary. Because of the difficulty of breeding cats in captivity or of keeping any number of dogs for breeding purposes it was decided to attempt this work with rabbits, but when the anatomy of the female organs in the rabbit was studied it was found that practically it would be impossible to dissect out sympathetic fibres. The plan of the experiments then had to be changed and it was eventually decided to try tying off part of the blood supply together with the nerve supply and see what effect that would have upon breeding.

For the purpose of the experiment adult rabbits weighing four to six pounds were used. These rabbits had all been previously bred by Dr. Castle[2] and the date and numbers of previous litters were known. In every case the right ovary was entirely removed in order to simplify the interpretation of results. Four females No. 1, 2, 3, and 4 were used as controls and they were bred a week after the right ovary had been removed. Rabbits No. 2, 3 and 4 gave birth to normal litters one month from the date of breeding. Rabbit No. 1 did not become pregnant immediately but when bred again one month later did become pregnant. This rabbit died in giving birth to her litter, but the litter was normal.

The other rabbits No. 5, 6, 7, 9, 10, and 12 also had the right ovary removed. In rabbits No. 5, 6 and 7 the left ovarian artery was tied off. These animals were bred repeatedly. No. 6 remained sterile and a section of the ovary is shown in Fig. 2. No. 5 and 7 eventually regained fertility after three months.

In a similar way rabbits No. 9, 10, and 12 each had the right ovary removed and the left ovarian artery tied. In the case of rabbits No. 10 and 12 part of the remaining ovary was also resected. They also were bred one week after the operation. In the case of No. 9 two young were born one month later, but there were no further pregnancies for nearly three months. In the case of No. 10 one young was born a month after the initial breeding, but though bred repeatedly during the succeeding three months no pregnancies occurred. A section of the ovary from this rabbit (No. 10) is shown in Fig. 4. Lastly in the case of No. 12 no pregnancies occurred though bred repeatedly during the next six months. A section of the ovary from this rabbit (No 12) is shown in Fig. 3.

It should also be stated that while union with the male actually took place at least once in every case the latter three females No. 9, 10, and 12, and female No. 6, practically invariably refused the male in spite of frequent attempts and acted in an altogether abnormal manner when placed in the cage with him.

*This work was aided by a grant of money from the National Research Council. It was carried out from April to December, 1923. The operative work was performed at the Harvard Medical School under the Department of Surgical Research.

FIG. 1.

Section of Normal Rabbit Ovary (×50).

Note the normally developing Graafian follicles, the recent large corpus luteum and other corpora.

FIG. 2.

Section of Ovary from Rabbit No. 6 (×50).

Note the atretic follicles, absence of corpora lutea and absence of Graafian follicle development. Ovary contains normal number of undeveloped follicles. This ovary is slightly smaller than the normal ovary. This decrease in size would seem to be due to the absence of activity.

FIG. 3.

Section of Ovary from Rabbit No. 12 (×50).

Note that this ovary is somewhat larger than the normal ovary. The increase in size would seem to be due to the presence of cystic follicles and follicles which have been undergoing haemorrhagic degeneration. This ovary does not show normal activity as the cystic follicles do not contain ova, and there is little luteal tissue.

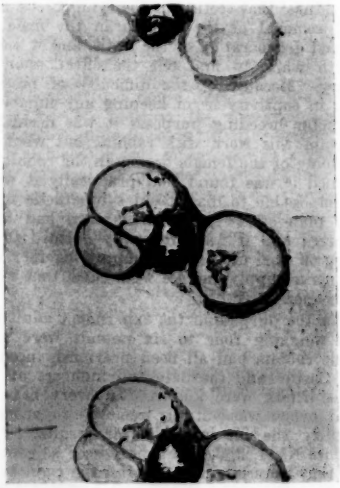

FIG. 4.

Section of Ovary from Rabbit No. 10 (×50).

Note that this ovary would be even smaller in proportion to the normal than it is were it not for the large cystic follicles of which it is chiefly composed. One of these follicles is shown containing a degenerating ovum. There is very little ovarian tissue. No normal follicles or luteal tissue can be seen. A degenerate haemorrhagic follicle occupies the centre of the specimen.

It is impossible to draw any conclusions from these few records, but it is certainly suggestive that interference with the normal nerve and blood supply, although not in any way sufficient to cause necrosis or gross pathologic changes, did interfere markedly with function. In certain cases the normal function was restored after a prolonged period; in others from which microscopic sections are submitted immediate or eventual sterility was produced. A preliminary study of these sections shows evident histologic changes.

APPENDIX

Rabbit No. 1. Female. 5 young. Feb. 3, 1923. Control. Operation Apr. 10, 1923. Removal right ovary. Bred Apr. 19, 1923. Not pregnant. Bred May 21, 1923. Died in labor June 21, 1923. Young normal. Record of number in litter lost. Description dil. sooty yel. Dutch. B. 4-30-21.

Rabbit No. 2. Female. 6 young. Dec. 16, 1922, and Mch. 2, 1923. Control. Operation Apr. 11, 1923. Removal right ovary. Bred Apr. 19, 1923. 5 young. B. May 19, 1923. Description Albino angora. B. 9-13-20.

Rabbit No. 3. Female. 5 young. Aug. 22, 1922, and Jan. 15, 1923. Control. Operation Apr. 11, 1923. Removal right ovary. Bred Apr. 19, 1923. 5 young. B. May 20-21, 1923. Description black. B. 1-17-22.

Rabbit No. 4. Female. 9 young. Feb. 3, 1923. Control. Operation Apr. 11, 1923. Removal right ovary. Bred Apr. 19, 1923. 6 young. B. May 20, 1923. Description gray. B. 12-9-21.

Rabbit No. 5. Female. 9 young. Dec. 19, 1922. Experiment. Operation Apr. 20, 1923. Removal right ovary, ligation left ovarian artery, puncture ovary, single suture. Bred repeatedly without success until the middle of June, 1923. 5 young. B. July 15, 1923. Description black silvered. B. 8-23-21.

Rabbit No. 6. Female. 5 young. Jan. 22, 1923. Experiment. Operation Apr. 20, 1923. Removal right ovary, ligation left ovarian artery, puncture, single suture. Bred repeatedly without young. Refused male after May 1, 1923, in spite of numerous attempts up to September, 1923. Killed Sept. 21, 1923, post mortem showed no inflammation or other abnormalities. Ovary sectioned. See Fig. 2. Description gray angora. B. 10-21-20.

Rabbit No. 7. Female. 8 young. Feb. 3, 1923. Experiment. Operation Apr. 20, 1923. Removal right ovary, ligation left ovarian artery. Bred repeatedly but not successfully until the last of June, 1923. 5 young. B. July 25-26, 1923, 1 living, 4 dead. Bred again successfully. Description St. gray angora self. B. 6-30-21.

Rabbit No. 8. Male. Description sooty yel. English. B. 8-16-20. Tested fertile. Alternate male. Description yellow. Date of birth uncertain, about one year old. Tested fertile.

Rabbit No. 9. Female. 5 young. Dec. 18, 1922. Experiment. Operation Apr. 20, 1923. Removal right ovary, ligation left ovarian artery. Bred May 1, 1923. 2 young. B. June 1, 1923. Subsequent breedings normal. Description Albino angora (4881 A). B. 3-3-21.

Rabbit No. 10. Female. 6 young. Sept. 23, 1922. 9 young. Jan. 20, 1923. Experiment. Operation May 1, 1923. Removal right ovary, ligation left ovarian artery, one-quarter left ovary resected. Bred May 13, 1923. 1 young. B. June 13, 1923. Died in 2 days. Female bred repeatedly up to Sept., 1923, without pregnancy. Killed Sept. 21, 1923. No sign of inflammation. Tube patent. Ovary grossly cystic. Sectioned. See Fig. No. 4. Description blue angora. B. 4-17-21.

Rabbit No. 11. Female. 5 young. Dec. 19, 1922. Experiment. Operation May 1, 1923. Animal found already pregnant and so no procedure carried out on ovary to determine effect of laparotomy on pregnancies. 7 young. B. May 22-23, 1923, 5 living, 2 dead. Description chocolate. B. 2-12-21.

Rabbit No. 12. Female. 7 young. Jan. 15, 1923. Experiment. Operation May 1, 1923. Removal right ovary, ligation left ovarian artery, resection one-half left ovary. This rabbit was also pregnant at the time of operation but the pregnancy must have been interfered with by the operation with subsequent absorption of the embryos as no young were born. Bred May 13, 1923, and many times thereafter, unsuccessfully. Female usually refused the male. The last time in Nov., 1923. Killed Nov. 3, 1923. Post mortem examination showed no sign of inflammation. The ovary was sectioned and is shown in Fig. 3 Description albino Himalayan angora. B. 4-14-21.

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FATAL ASTHMA. REPORT OF A CASE WITH AUTOPSY*

BY FRANCIS M. RACKEMANN, M.D.

DEATHS from asthma are rare. By "asthma" is meant simply bronchial constriction from any cause, and in this case, severe enough to cause asphyxia. In a series of over one thousand cases of asthma seen during a period of six years, only five deaths have occurred in patients who were under immediate treatment. These five deaths were apparently due to a severe attack of asthma, since before death in all cases and at the autopsy of one of them, no other definite cause of death was found.

In 1922, Huber & Koessler[1] published a very complete and comprehensive study of the pathology of asthma, in which they presented the outlines of the clinical histories and the detailed reports of the findings at autopsy, in fifteen cases of deaths occurring in patients with asthma, which they had collected from the literature and in six cases which they were able to report from their own material.

Analysis of these twenty-one cases shows that while each patient had had asthma with its characteristic symptoms and its variable severity, yet this asthma was the cause of death in only a small proportion of these twenty-one cases. To emphasize this fact, a brief summary of each case follows:—

Cases 1 and 2 had failure of the heart and kidneys for the last month and died with much oedema. Case 3 was a waitress of 49 whose first asthma oc-

*From the Out-Patient Department of the Massachusetts General Hospital.

curred only three weeks before death. At autopsy the upper lung lobes showed numerous tumor nodules, the tissue of which had the arrangement of medullary carcinoma. Case 4 was an old man with chronic bronchitis, emphysema and heart failure. Case 5, however, was a man aged 48 with severe, almost daily, paroxysms of asthma for one and a half years, with death occurring in collapse in a severe attack. He died evidently of asthma. Case 6 died of pneumonia after six months in the hospital under treatment for emphysema. Case 7 was a woman of 46 who had had asthma for twelve years and died in an acute attack of asthma. Case 8 was a man of 27 under treatment for tachycardia and asthma for one year, who died in an acute attack of dyspnoea and showed markedly distended lungs at autopsy—evidently a death from asthma. Case 9 was another young man of 29 who had had dyspnoea on exertion with asthmatic attacks for four years and who was admitted to the hospital with generalized oedema, a short time before death. The lungs were dilated and the organs showed a chronic passive hyperemia. Evidently some disease in addition to asthma was present. Case 10 was a child of 2 in bad condition with eczema and asthma. Case 11 was a woman of 29 who had a cavity in the upper lobe of the left lung, a large duodenal ulcer and a severe gastro-intestinal hemorrhage which began two days before death and continued to the end. Case 12 was a small, well-preserved woman of 53 with a history of asthmatic attacks since the age of 30. It was thirteen years after this onset that she first entered the hospital with asthma, emphysema, and chronic laryngitis. She improved very much after six weeks' stay and did not return to the hospital during the next ten years. Six weeks before her death, she developed a new attack and entered the hospital four weeks later, with dyspnoea, severe cough and much sputum. Death occurred in two weeks. Autopsy showed vesicular emphysema, recent tuberculosis of the bronchial glands, and hypertrophy of the right ventricle. "Asthma" (severe bronchial spasm) was without doubt the actual cause of death. Case 13 was a woman of 45 but small and emaciated, who died in her third attack of asthma, all three attacks having occurred within a year. At autopsy there was found a marked fibrinous bronchitis as well as emphysema; also there was a healed apical tuberculosis and a fibrinous lobular pneumonia. Case 14 was a man of 48 who had been exposed for four years to fumes in a chemical factory. Asthma began two years before death, and although he was free of trouble during the last summer, the attacks returned. About ten weeks before death both legs began to swell and he entered the hospital with edema and cyanosis of face, inspiratory dyspnoea, prolonged expiration, but a heart and urine which were negative. His condition gradually became worse, and about nine weeks after entrance he died. This man had asthma, but the presence of oedema and cyanosis would argue for a cause of death other than, or at least in addition to, his asthma. Case 15 was a man of 53 with asthmatic attacks since childhood but who died with hypertrophy and dilation of the heart, anasarca and congestion of the organs.

The six original cases reported by Huber & Koessler died in these ways:—

Case 1 was a woman of 58 with asthma for two years who committed suicide by drowning. Case 2 was a man of 55 much emaciated, who died after six years' suffering from chronic bronchitis and emphysema. Case 3 was a girl of 17 who died of a streptococcus septicemia from sore throat. Case 4 died immediately after an infection of horse serum given by another doctor. Case 5 died of bronchopneumonia. Case 6 was an infant with asthma and eczema.

Thus, of this total of twenty-one cases included in Huber & Koessler's report, there were only four whose death could with some certainty be attributed to uncomplicated bronchial spasm, namely,—the literature cases numbered 5, 6, 8 and 12. In addition however, their own Case 1, who committed suicide, was a middle-aged woman with very severe asthma for two years. It is not too much to assume that this asthma might have killed her eventually.

In 1923 Lemierre, Leon-Kindberg and Levesque[2] reported a fatal case of asthma in a man of 58 who in the midst of apparent health, was seized with intense dyspnoea ten weeks before his death, which was evidently due to asthma.

This makes six cases of deaths from asthma reported in the literature. The clinical histories of five cases seen by the author but in which no autopsy was obtained, will be summarized later. Even when these are added to the literature, the total of reported deaths is only eleven, a number so small as to justify calling attention to the following case report:

Mrs. L. M. S. was a woman of 39 who first came to the hospital in February, 1923, with asthma and a big thyroid gland. She had noticed the tumor in her neck for six years, but dyspnoea on exertion, together with a choking feeling and a dry cough, had been present only for two years. In the last six months she had lost 25 pounds.

She had had hay fever every September between the ages of 14 and 27. Since the hay fever stopped in 1911, she had had two or three spells of asthma at variable times, but beginning in September, 1922, the asthma had become worse each year and was more or less constantly present. In times past, she had been hypersensitive to feathers, ragweed, horses, cats, egg white and wheat, and was conscious that cats and horses bothered her.

In March, 1923, a cyst adenoma of the thyroid was removed under novocaine, but the operation brought no relief to her asthma, which in the fall of 1923 became worse again, and through the winter was severe and pretty steady.

In August, 1924, treatment with extract of cat hair and horse dander did not help her. She had developed an almost continuous asthmatic state requiring large doses of morphine. In September a doctor outside had given her iodide intravenously.

She entered the medical ward on October 27, 1924. She was a middle-aged woman distinctly well nourished but profoundly asthmatic and unable to lie down in bed. Except for her asthma, physical examination was negative. The blood pressure was 130/110, pulse 140—the white count varied from 20,000 to 9,000 with three per cent eosinophiles. The urine gravity was 1.026. There was no albuminuria. X-ray of her chest gave essentially normal findings, X-ray of the sinuses showed an irregular density in the right frontal but were otherwise negative. Teeth were negative. Skin tests by the scratch method showed slight reactions to cat, horses and ragweed, but were otherwise negative.

Her improvement on the ward was slow, but on October 28 she was able to go home. That day, however, she vomited and began to wheeze, but recovered rapidly and did well at home until November 12, when a sudden severe attack of asthma seized her and morphine was again required. For the next two weeks she took adrenalin from four to ten times a day but without avail, and finally she was readmitted to the hospital on November 24, 1924.

Her condition was about the same as on the pre-

vious admission. Skin tests showed similar reactions. She was given a diet limited to the test-negative foods as found and was given belladonna, but without much improvement. November 28 she was moved to a single room in another ward where there is a terrazzo floor and smooth painted walls. The next day, however (November 29), and again on the 30th, she had a virtual collapse following a violent seizure of asthma, which almost amounted to a cessation of respiration. The attack passed off slowly. On the 31st, a similar seizure lasted for an hour. After this, however, there was some improvement, and indeed for almost three weeks her attacks were relatively mild and could readily be controlled by adrenalin, of which she still required from one to five doses in 24 hours.

On December 20, in the evening, she had another violent seizure, which lasted two and one-half hours before she relaxed. During this period she was given in different doses a total of 3.00 c.c. of adrenalin, 4 drams of paraldehyde by rectum, and two-thirds of a grain of morphine. During the late evening she was more comfortable, but at 2 A. M. she went into a complete collapse and died.

Autopsy—(Abstract of M. G. H. Report No. 4774.) The body was of a woman in excellent condition. It had just been embalmed. Rigor mortis was present.

The lungs were paler than normal and extremely light for their volume. The two, together with the mediastinal tissues and the trachea, weighed only a kilogram. The apices and the margins of the lobes were markedly emphysematous, especially the right apex, which was almost bulbous because of the widespread dilatation. The left apex was also emphysematous, but not to so marked an extent as the right. On section, the alveoli could be seen microscopically; they did not collapse as rapidly as is usual with emphysematous tissues. The process seemed to be disseminated throughout the lung and not localized to small area of bleb tumors as in other cases. The tracheal mucosa was slightly injected but smooth and shining. The bronchi had a small amount of tenacious mucopurulent material, slightly blood tinged, adherent to the mucosa. The mucosa itself was smooth and shining and did not seem thickened. The bronchial glands were small, averaging 1 c.c. in diameter. Cross-sections showed them to be filled with black pigment, but not otherwise abnormal.

Sections were taken across the trachea and the larger and smaller bronchi. Microscopical examination showed in the walls of some of the bronchi, infiltration of inflammatory cells, among which were many eosinophiles. There was well marked emphysema. The musculature of the bronchi was negative. The heart weighed 290 grams. It appeared to be smaller than normal for the size of the woman. The valves were normal. The right ventricle was dilated, but otherwise there was no evidence of cardiac disease. The aorta was elastic. The liver and gall bladder were normal. The spleen was enlarged to twice its size. The cut surface was of dark reddish brown color, with a grayish white mottling. The pulp scraped off quite readily. Microscopic section showed some hyaline degeneration of the arteries. The kidneys were essentially normal. The capsules stripped off easily. The surfaces were smooth. The parenchymal markings were normal. The kidneys weighed three hundred grams. The adrenals were normal. The uterus was normal. The left ovary contained a cyst two centimeters in diameter, filled with a chocolate colored fluid, and the right ovary had several similar but smaller cysts.

The anatomical diagnosis was:

Bronchitis
Emphysema of Lungs
Localized Chronic Peritonitis
Cysts of the Ovaries

Summary—A well nourished woman of 43 with a history of hay fever between the ages of 14 and 31, and positive skin reactions to timothy and ragweed, began when the hay fever stopped to have attacks of asthma, at long intervals. Two years ago, however, this asthma became very much aggravated and the attacks came more often and were of longer duration. Finally death occurred during a severe paroxysm.

In spite of positive skin reactions the evidence of an extrinsic cause of her asthma was not clear, since attacks had occurred at different seasons and with different surroundings. Removal to a room in the hospital relatively free from dust, did not help her. The fact that the asthma occurred in well defined attacks, is unexplained.

Clinically, there was no cause of death other than asthma and at autopsy, there was found only acute dilatation of the right ventricle, together with pulmonary emphysema.

In addition to this patient on whom an autopsy was performed, four other deaths which were clinically due to asthma and to asthma alone, have been observed.

Mrs. H. D. T. was a rather plump woman of 49 who had had asthma at the age of 19 for three years, until a change of residence was followed by freedom from further trouble until the age of 48, when her asthma returned in a form which was steady, from day to day and week to week, and apparently uninfluenced by various forms of treatment. Following a very severe attack, which began six hours after a subcutaneous dose of her own defibrinated blood, she recovered for a time and then died 48 hours after the onset of another extremely severe and prolonged attack. During her severe asthma her heart action seemed normal. The pulse was very rapid but perfectly regular. She passed urine of normal character in adequate amounts. No cause of death other than the asthmatic paroxysms was evident.

Mrs. F. S. P. (referred by Dr. F. E. Withee of Newton Highlands) was a woman of 41, well nourished and of healthy appearance. She had had asthma since the age of 11 in attacks which occurred after head colds, two or three times a year. Between the ages of 35 and 40 she had had no asthma, but had had eight different operations on her nose and sinuses. In spite of treatment, nasal obstruction had recurred and with it the first asthma in four years. Following a more radical drainage of her nasal sinuses, this asthma then disappeared for two and one-half months, but then recurred three months before her death. When seen on May 30, six weeks before death, she was fairly comfortable, and physical examination at that time revealed nothing abnormal—not even emphysema. Skin tests were negative and there was no evidence of an extrinsic cause of her asthma. A vaccine made from a staphylococcus albus, obtained in culture from her nasopharynx, was given in increasing doses, and she improved to such an extent that five weeks later her husband wrote, "The patient is mending in a manner most gratifying to herself and family." Five days after this, however, she went in town and walked about a mile, when asthma suddenly recurred and was severe, lasting for a day, and then milder, until a week later her last attack began without warning and caused death in six hours.

Mrs. R. (referred by Dr. Arthur Mitchell of Med-

field) was a rather small, plump woman of 51, whose asthma began at the age of 34 and had recurred every winter, in spite of many different forms of treatment. This asthma was evidently dependent upon an intrinsic cause, presumably upon recurrent bronchial infections. Her blood pressure was 170/120, her vital capacity was only 50 per cent of normal, and she did have dyspnoea on exertion. However, adrenalin did relieve her symptoms and she had never had oedema of ankles or lung bases. Dr. Mitchell describes her during her last four days as presenting "the usual appearance of one suffering from an unusually severe case of asthma, with hypocratic expression, marked cyanosis and every respiratory muscle working to a painful degree." Evidently bronchial spasm was a very important cause of her death.

Mrs. E. E. P. developed asthma at the age of 40 and three weeks after the birth of her sixth child. This attack, however, lasted only three weeks. A second attack occurred three months later and lasted only one week. After this, she had no further asthma for three years, until at the age of 43, in October, nine months before her death, her last attack began. This onset was coincident with the purchase of a new mattress, but skin tests to pollens, animal danders, house dusts and to mattress hair (not from her own mattress) were all negative. On admission to the hospital in July, a week before death, she was a fairly well developed woman with recent loss of weight and moderately severe asthma. The blood pressure was 160/120 and the heart slightly enlarged, but the urine was clear and the phthalein output 20 per cent. For a few days she improved, but then her asthma became much worse, and after a terrific struggle for breath which lasted for over 48 hours, and could not be relieved by adrenalin, chloral hydrate or morphia, she died.

Discussion—These five fatal cases of asthma can readily be compared one with another as well as with three of six cases of death from asthma collected and described by Huber & Koessler. These eight cases were all in well nourished women of middle-age. The ages at death varied only between 41 and 55. The ages at onset of asthma varied between 34 and 53, except in three instances where an initial series of attacks had begun at or before the age of 20. Skin tests were negative in all but one of the author's cases. In this case as reported in detail, the fact that death occurred in winter and after a month's confinement in a rather unusually clean room in the hospital, would seem to eliminate the importance of tests to pollens and danders as indicating the true cause of asthma.

On the other hand, in almost all the cases, evidence of foci of infection either in paranasal sinuses, in teeth, tonsils or in abdominal organs, was present.

On the basis of these eight cases, attention is called to a group of asthmatics in which the severity of attacks may at any time become intense enough to cause death by asphyxia.

The group may be defined as follows: The middle-aged well nourished woman whose asthma has begun usually after 30 years of age, and is at times severe; in whom the evidence of hypersensitiveness to foreign substances is small; who is not relieved by sojourn in the hospital ward, and who may present evidence of some focus of infection; is very difficult to treat and carries a bad prognosis.

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STRANGULATED RETROCOLONIC HERNIA OF THE ASCENDING COLON AND CAECUM; OPERATION, RECOVERY

BY WELLER VAN HOOK, M.D.

CASE: A girl eighteen months old, of average size and development, had been in unusually good health until, on the morning of July 25, 1920, she was seized with severe, paroxysmal abdominal pains which lasted during the whole day. Dr. F. W. Beilstein saw her in the morning but could find no abdominal tumefaction. In the late afternoon the bowels moved copiously and in the stool were a small quantity of blood and some mucus. On examining the patient at that time, Dr. Beilstein found in the right hypochondriac region a tumefaction which he regarded as due to an intussusception. The writer then saw the patient in consultation and concurred in the diagnosis. The temperature was about 100° F. There was but little tenderness, but a tumefaction about the size of a small Tangerine orange was felt in the right hypochondrium. The patient cried out when the tormina recurred at intervals of a few minutes. The bowels hardened and stiffened when the pain came.

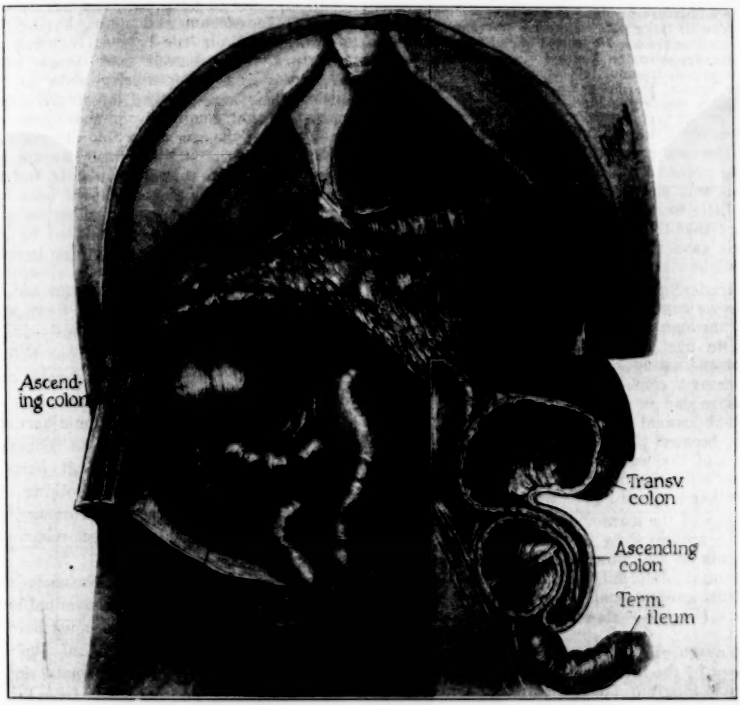
The mass could not be moved about in the abdomen, but the anterior abdominal wall slipped over it easily, giving the impression that its peritoneal covering was not inflamed. The intestines could be seen and felt through the abdominal wall, filling and stiffening as recurring peristaltic waves passed over them.

Laparotomy through the outer border of the right rectus muscle was performed at about 9 P. M. No fluid escaped on opening the peritoneum, but a few drops of reddish exudate were found in the vicinity of the tumefaction.

This tumefaction, devoid of coverings, was of the size and shape of a small hen's egg and lay in the right hypochondriac region about an inch below the edge of the little liver. It could not be lifted out of the abdomen, but could be slightly moved upon the posterior abdominal wall to which it was attached. It was seen that the mass was a sac containing bowel, the opening into which was visible. The appendix vermiformis, together with large intestine and a portion of the ileum, could be noted protruding from the sac. The ascending colon constituted the anterior wall of the sac, and the inner and outer plates of the mesocolon formed respectively the inner and outer walls of the hernial bag. Hence the colon passed downward from the hepatic flexure, and formed the anterior wall of the sac, and then, bending abruptly backward, became itself the major part of the contents of the sac, the remainder of the contents being a few inches of the ileum and the greater portion of the vermiform appendix. The opening of the sac was patulous. The long axis of the mass pointed toward the anterior superior spine of the

ileum, the whole being soft and of the tension and resiliency of intestines. The color was that of the intestines except that all was darker red than usual. All the very extraordinary conditions were not instantaneously understood, but were recognized after reduction had been effected.

Very gentle traction was made on the protruding parts. With no difficulty or questionable pulling, the sac was emptied. The ileum was first drawn out and it was followed by the appearance of the caecum and the appendix. When this mass had been pulled out to the extent of two and a half or three inches, the present, but no fibrinous exudate was observed anywhere. The appendix, however, was now seen to be in a well-marked but not violent state of inflammation, being swollen and turgid. It was removed. It was not perforated nor was there any gangrene. It is important to state, with emphasis and categorical clearness, that there were no adhesions, either old or recent. All the peritoneum was smooth and free of irregularities of every kind, the only marks of inflammation being the slight exudate, the swollen appendix and the already noted hyperaemia. All the parts showed but little evidence of strangulation,



A strangulated retro-colonic hernia in a child. Operation Recovery.

tumefaction suddenly disappeared altogether. It is thus seen that we had to deal with a hernia of the caecum, appendix and lower ileum into the space back of the ascending colon, this sac being a retro-colonic pocket.

The ileum then lay free, but slightly congested and oedematous, showing no more than a slight depressed line to indicate where its wall had been in contact with the neck of the sac, which had exerted no marked pressure upon it. The ascending colon above, running up towards the liver, then came to lie normally flat upon the posterior abdominal wall. And the caecum, at first almost empty of gas and other contents, and provided with a long meso-caecum, was free in the abdomen, bearing normal relations to the ileum and the appendix.

There was a little viscid fluid of a reddish color aside from slight distension and a little oedema. The sac wholly disappeared after the reduction. Its contents had been in contact posteriorly with the abdominal wall-peritoneum, and anteriorly with the posterior wall of the ascending colon.

At the site of the fold of constriction no blood vessels of any size were seen. There were no marked pockets about the caecum, nor was there any evidence that the hernia had its origin in either of the pockets about the ileo-caecal junction, although the writer had expected to find such an origin of the hernia when once it was discovered that we had to deal, not with an intussusception, but with a hernia. On the contrary, the caecum, the ileo-caecal junction, and the ileum showed no sign of malformation, although, of course, there was a very long mesenteric fold for both ileum and caecum, which floated quite

free when reduction had been effected. The various sacs and pockets described so minutely by anatomists back of the caecum and on either side of the ileum were of the common, undeveloped size and condition. The only deviation from the usual conditions that could be observed after reduction was the length of the meso-colon and the meso-caecum.

The excised appendix, on being split longitudinally, showed marked swelling and hyperaemia of the mucosa, muscular coats and peritoneum. And within the canal of the appendix was bloody mucus, mixed with thin faecal matter. The appendicitis apparently caused the rise of temperature.

The admixture of blood in the stool seems to have been due in large part to the haemorrhagic appendicitis, although some diapedesis of red corpuscles may have occurred in the ileum and caecum on account of the slight, incomplete obstruction.

The hernia, therefore, was not a retro-caecal hernia but a retro-colonic one.

It is my opinion that the formation of the sac and the incarceration of organs in it dated back to the prenatal period, and that only the appendicitis was acute. The appendicitis, therefore, had little to do with the hernia and *vice versa*, except that the congestion caused by the appendicitis gave rise to enough swelling to produce the slight strangulation and partial obstruction.

Hertzler* points out, as does Moynihan, that, while we can understand the formation of hernias through the abdominal wall as being at least in part due to pressure from within the abdomen, acting through a break in the wall, we cannot consider that the intra-abdominal pressure can be a factor in the production of intra-abdominal hernias under ordinary conditions, because that pressure is equalized by the action of the walls of the abdomen functionating as reflectors for the forces concerned. And Moynihan's reasoning corresponds.

Many of the intra-abdominal hernias depicted by the writers show their sacs enveloping their contents so voluminously and freely that only congenital deformity of the intra-abdominal contents can rationally account for their existence. Mitchell's classical case is much to the point.

Many surgical writers have traced the development of the intestinal tube, which, starting as a single longitudinal gut, gains its convolutions as it grows. A most significant case published by J. A. Twyman ought to be studied as bearing on this subject. In that case the lower ileum was found, on opening the abdomen, to pass under the ascending colon to the outside of that bowel and then downward to join the caecum near the usual point. As Hertzler points out, this anomaly must have been due to the outward rotating of the ileum before the colon had passed down and over the posterior abdominal wall to become attached at its usual site. In this way the colon passed over the ileum. If this actually occurred it is reasonable to suppose that the erratic movement of other phases of the developing intestine may similarly account for the formation of other including sacs. Where a portion of one bowel thus lies behind another, tunneling under it, and where reduction cannot be effected, the surgeon need not consider the case irremediable. For in many such cases, I suggest, one or both the intestines affected can be temporarily transected and carried over the other bowel and reunited. I have has no opportunity to apply this idea.

I conceive the anomalous conditions pertaining in my case to have occurred pre-natally as follows: the caecum and ileum having begun their descent from the hepatic region a slight premature agglutination took place between their coats and the posterior abdominal wall causing their arrest. The downward pressure upon the colon coming from above caused the upper part of the ascending colon to glide down and fold over the slightly fixed caecum. This caused the caecum with its appendix and a few inches of the ileum to be enclosed back of the colon in a well marked pocket or hernial sac.*

When reduction had been effected by gentle traction in my case, it was surprising to see how simply all traces of the anomaly disappeared. The caecum hung free, with the attached ileum and its elongated mesentery and there was no pocket left into which the previously included parts could have been forced if one had tried to do so, except perhaps by considerable manipulation and much skill.

The case was one of retro-colonic hernia into a sac that was self-obliterating on reduction of the hernia. The relations of all parts concerned became such, then, that nothing had to be done surgically to prevent recurrence, for it would have been difficult to effect recurrence if one had tried.

This extraordinary case impels us to emphasize the fact that all the intra-abdominal hernias, as indeed all hernias in general, must be studied primarily from the view-point of the labile, moving, changing anatomy of pre-natal and post-natal development, and not solely from the view-point of the normal or usual anatomy of the body as found at the time of investigation. To imagine that the anomalous conditions described above could have arisen as the result of the slipping of the incarcerated organs into a pre-formed pocket or sac would involve violent insult to reason. But it is easy to conceive of an irregularity in the orderly progress of colonic descent and adjustment, with the simple overlapping of one part of the tubing, devoid of gas-content and, therefore, free of distension, by another.

*The Peritoneum, Mosby, 1919.

*Toldt (Toldt: Denkschrift d. k. Akad. d. Weiss., 1889 Bd. 56) refers the formation of a recessus retro-caecalis, according to Zoepffel, to the incompletely successful adhesion between the ascending colon and caecum with the posterior abdominal wall.

STUDIES OF THE VITAMIN POTENCY OF COD LIVER OILS

XIV—The Variation in Daily Food Consumption of Experimental Animals*

BY ARTHUR D. HOLMES, AND MADELEINE G. PIGOTT

WHEN our investigation of the vitamin potency of cod liver oils was commenced, a question naturally arose as to whether the oil under investigation should be included as a constituent of the experimental diet or whether it should be fed separately from the diet.

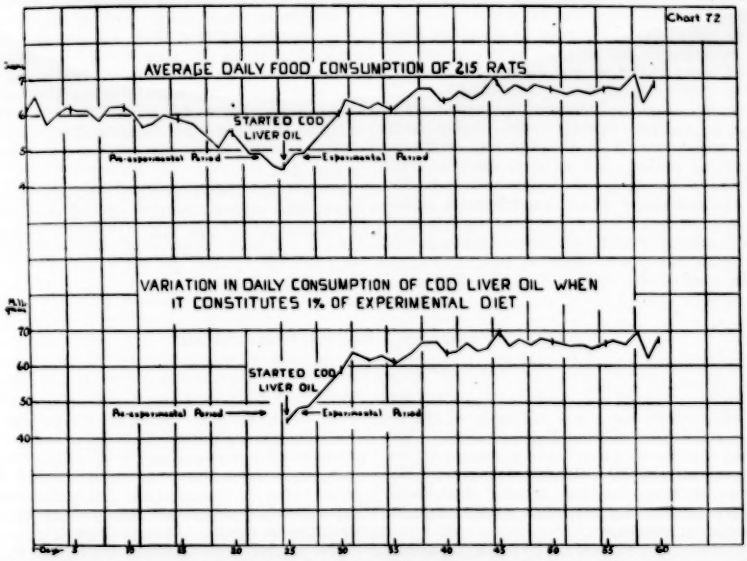
If the oil which is being tested constitutes a part of the experimental diet, the amount of oil that the animal receives depends on the amount of food that it consumes. Consequently, unless the animal maintains a uniform daily food intake, its oil consumption varies from day to day. Since we desired to administer a uniform amount of oil daily, we decided to feed the oil separate from the experimental diet.

It is our practice to make a record of the daily food consumption of each experimental animal, and from those records one can compute the average daily food consumption of rats used for studying the vitamin potency of fats and oils. A consideration of such data reveals a striking discrepancy between the amount of oil ingested by the experimental animals when it is fed separate from the diet and the amount that would have been ingested if the oil had been incorporated in the diet.

This situation is particularly true when the experimental periods are of short duration.

For the purpose of this discussion, data concerning the average daily food consumption of laboratory animals are included for both the experimental period and the pre-experimental period. These periods represent respectively the thirty-five days following and the twenty-five days preceding the addition of oil to the diet.

The animals were fed the same diet during the pre-experimental and the experimental periods. It consisted of purified casein 18%, peanut oil 22%, corn starch 28%, milk sugar 28%, salt mixture 4%†, supplemented by a 0.2-gram tablet of dried brewer's yeast daily. In some experiments the peanut oil was replaced by an equal amount of aerated cottonseed oil; in other tests the milk sugar was replaced by an equal amount of corn starch.



The upper curve of the accompanying chart reports the computed average daily food consumption of 215 albino rats for the sixty days of the pre-experimental and experimental periods. From this chart, it will be noted that the average daily food consumption of this group of animals decreased constantly, although irregularly, during the entire pre-experimental period. However, as soon as cod liver oil was added as a supplement to the ex-

*From the Research Laboratories, the E. L. Patch Company.

†Osborne and Mendel: Jour. Biol. Chem., 37, 1919, 572.

perimental diet, the food consumption increased very rapidly for six days, after which it averaged between six and seven grams daily.

While the average daily food intake ranged from six to seven grams, the maximum food consumption of individual animals was as much as eleven or twelve grams, and on many days some animals of the group failed to eat anything. In the latter case, if an oil which was being tested for its vitamin potency had been included as a constituent of the experimental diet, the rat obviously would receive no oil; whereas, since the oil was fed separate from the diet, the animal received the usual amount of oil. It is our experience that the animals eat cod liver oil with avidity regardless of their appetite for the experimental diet.

The second curve included in the chart shows the variation in cod liver oil consumption that would occur if the oil was fed as a constituent of the experimental diet. Assuming that 1% of oil has been included in the experimental diet, the average animal would receive forty-eight milligrams of oil the first day of the experimental period, and six days later it would be consuming sixty-six milligrams per day. For the remainder of the experimental period, the oil consumption of the average experimental animal would vary from day to day by something like five milligrams.

The method for determining the vitamin A content of cod liver oil specified by the 1926 edition of the U. S. Pharmacopoeia provides for a thirty-five-day experimental period. On referring to the second curve, it will be noted that for the last four-fifths of the thirty-five-day experimental period, the daily variation in food consumption is of such a nature that one can compute a fairly average daily consumption.

In determining the antirachitic value of cod liver oil and other substances, it has been a more or less common practice to judge concerning the antirachitic activity by observing its calcifying power during a five-day experimental period immediately following the addition of oil to the experimental diet. As pointed out above, when cod liver oil is incorporated in a vitamin deficient diet, the amount of oil ingested increases for each day of the short experimental period until on the sixth day the animal receives 33% more vitamin than on the initial day. Contrasted with this is the possibility of administering uniform daily doses of oil if one feeds the oil apart from the experimental diet.

From these observations, it appears that for testing the vitamin content of cod liver oil, it is preferable to feed the oil under consideration separate from rather than as a constituent of the experimental diet.

NON-PNEUMATIC LUNG COLLAPSE*

BY HERBERT F. GAMMONS, M.D.

THE above caption is used to describe that condition where there is a falling in of the tissues of the lung surrounding a cavity. This should not be confused with a pneumothorax. In fact, this condition is diametrically opposed to pneumothorax, in that, instead of air being in the pleural cavity there is a marked negative intrapleural pressure.

This condition occurs rarely, and, as a rule, in patients suffering with pulmonary tuberculosis. However, its possible occurrence must be kept in mind on account of the beneficial results obtained by instillation of air into the pleural cavity. The amount of air to be used and the length of treatment depends upon the condition of the opposite lung and the extent of displacement of the heart. The following case is of interest: M. A. Male—thirty years old. Weight 100 pounds. Examination July 26th, 1925, showed: Right lung—Limitation of motion. Tactile fremitus increased throughout. Vocal fremitus increased above the third rib and fourth dorsal spine. Resonance impaired throughout, more marked over limits of upper lobe. Breath sounds weak throughout, with cavenous breathing in an area above the third rib. Medium coarse post-tussive rales throughout. Left lung—Slight impairment of resonance and few medium coarse post-tussive rales above the third rib and third dorsal spine. Temperature and pulse normal. Expectoration slight in amount and positive for tuberele bacilli. Cough very slight.

The patient went to work as a barber shortly after the above examination and in a few weeks began to cough and raise sputum in increasing daily quantities until he averaged about twenty-four ounces of purulent sputum daily. Hemoptysis occurred and temperature and pulse were increased. At this time the patient complained of continual oppressive pain above the third rib on the right side. The pain was persistent and not influenced by breathing.

Examination shortly after this showed, right lung-marked dullness above the third rib. Marked limitation of motion and retraction of the chest wall. Increased tactile and vocal fremitus throughout. Cavenous breathing in an area above the third rib. Medium and coarse post-tussive rales throughout. The cardiac impulse was almost to the nipple line on the right side. Fluoroscopy showed the heart

*From the Arkansas Tuberculosis Sanatorium. Dr. John Stewart, Superintendent.

and mediastinum displaced to the right and no motion of the diaphragm which was higher in position than normal. The pain and discomfort persisted, but the hemorrhages ceased. The cough and expectoration decreased.

Five hunded cubic centimeters of air were injected into the right pleural space with decrease of pain and after three instillations of like amounts every two days, the pain disappeared, the heart went back to its normal position and temperature came down to normal. There was a marked negative pressure at the start. This patient is still taking artificial pneumothorax and is without symptoms of activity.

It is probable that this condition would not occur in a patient with a cavity with walls well fibrosed. This is one of two cases seen recently, and the conspicuous feature is the pain of an oppressive nature not influenced by breathing and usually following severe cough with marked production of sputum.

Patients with this complication need treatment for the good effect of the compression of the diseased lung, and for the relief of traction on the lung of the opposite side and to remedy the displacement of the heart.

Fluoroscopic and X-ray examinations prove the diagnosis.

NYSTAGMUS

BY EDWIN BLAKESLEE DUNPHY, M.D.

It is the purpose of this article to classify briefly the various types of nystagmus and in particular to review the causes of nystagmus due to ocular lesions.

Definition: Nystagmus consists of a series of rapid, short, to and fro movements of the eyeballs, probably due, generally speaking, to some perversion of the centres governing the ocular movements. Both eyes are usually affected and to about the same degree. The usual type is horizontal. The oscillations occur 1 to 3 a second and are about 1 to 4 mm in length.

We must differentiate between the true nystagmus in which the eyes swing to and fro in accordance with associated movements and mere twitchings which resemble nystagmus and which may appear when the eyes are turned far in any direction. These twitchings are probably due to an anomaly of the tonicity of the muscles, or a fitful contraction of the muscles accompanying sustained effort.

A few words about the mechanism of nystagmus—The static labyrinths are the essential organs of equilibration. Movement of the endolymph in the semicircular canals sends forth impulses which travel to the cerebellum, cerebrum and oculomotor nuclei. The nerve pathway from the horizontal canal goes over the vestibular nerve to Deiter's nucleus and thence through the posterior longitudinal bundle to the nuclei of the 3rd, 4th and 6th nerves which control the eye muscles. The pathway from the vertical canals is over the vestibular nerve to upper portion of medulla, upward in the pons to level of middle cerebellar peduncles where fibres enter the posterior longitudinal bundle and go to the 3rd, 4th and 6th nuclei.

There are two distinct types of nystagmus, the pathology being quite different in each.

(1) Springing nystagmus; (2) Undulatory nystagmus.

The former is characteristic of vestibular stimulation. There is a slow movement of the eyes one way (vestibular) followed by a quick return of the eyes to the original position (cerebral). This type is seen in suppuration of the labyrinth and also can be artificially produced in normal subjects by the Caloric and Barany tests. It is frequently seen in cerebellar abscess, tumors of the cerebellar-pontine angle and practically always in tumors of the cerebellar itself. It occurs in Friedrich's ataxia and multiple sclerosis, less often in encephalitis and syringomyelia. It is not unusual to observe it in Little's Disease and in Idiocy.

Undulatory nystagmus is, as the name implies, a slow, uneven affair without any rapid component. It comes from the constant effort of the eyes to get the image on the macula in spite of optical defects. The tonic association centres receive an abnormal stimulus due to inability of accurate fixation. The eyes tremble and deviate but the rhythmic centres, abnormally stimulated, come into play and a nystagmus of the undulatory type results. This is the type seen in cases of ocular origin.

The various types of ocular nystagmus have been reviewed by Holmes Spicer[1] in a study of 200 cases. In 50% the movements were horizontal; 15% rotary; 12% vertical; 4% mixed; 2% irregular; 2% circumductory; and in 1% disjunctive. The nystagmus disappeared during selep and sometimes in the dark. It did not occur in those born blind. Use of the eyes was necessary for its existence. The most important factor in its causation was a faulty retinal image due either to disease of the macula or optic nerve or to opacities in the vitreous lens or cornea. It was not proven that errors of refraction caused nystagmus but it was certain that great improvement was obtained by correction of high astigmatism. Albinos and those with excessive pigmentation often had nystagmus. In his opinion, ocular nystagmus might be said to

be due to disease of the afferent path concerned with the reflex for fixation of the eyeballs. If macular development were interfered with in infancy so that there was not a clear image on the fovea, the cerebral coördination was not brought into play to keep the eyes rigid, hence the constant oscillatory movement.

Although opacities of the cornea and media are spoken of in all text books as chief causes of nystagmus, it is a well known fact that only a very small percentage of such cases have nystagmus even when the opacity has been present for years. On the other hand, nystagmus of the undulatory type is found usually in these cases of corneal and medial opacities. This would seem to indicate that the cause of the nystagmus is elsewhere, the corneal opacity being a mere incident, or at the most only a contributory factor.

The fact that in diseases of the anterior part of the eye, the posterior part is also often affected and the relative inability to study the fundi in these nystagmus cases, would lead us to the conclusion that the uveal tract is involved much more frequently than we can see, and that nystagmus is due chiefly to poor central vision.

It may be asked: If this is so, why doesn't nystagmus develop in cases of toxic amblyopia or retrobulbar neuritis where the papillo macular bundle is attacked and the macular function suspended? The answer is that these are usually diseases of adults in whom the cerebral coördination is fully developed and the eyes have had coördinate movements for years. It is the faulty retinal image during the age when coördinate movements are developing that gives rise to ocular nystagmus.

Albinos present the classical picture of undulatory nystagmus. The eyes of these patients usually appear photophobic and show large refractive errors, frequently myopia and astigmatism. They all have nystagmus. The pathology of this condition consists of an absence of physiological pigment and it has been assumed therefore that the nystagmus occurs from a desire to escape light. Closer investigation however leads us to a different viewpoint: that the nystagmus may be due to faulty development of the macula and a consequent effort to establish central fixation. This is suggested in Elschnig's[2] case of an albino in whom the macula had failed to develop. Gunn[3] found that the cones had lost their function in an albino and that the patient was really dark adapted. This would explain the photophobia as well as the nystagmus.

Miner's nystagmus is an interesting affection prevalent among miners of certain sections of England, thought to be due to constant eyestrain under poor illumination. The movements of the two eyes are often entirely different. Rotary nystagmus is the most common, but horizontal and disjunctive movements are often seen. There is also a general involvement of the cerebral centers shown by headache, vertigo, photophobia, muscle tremors. Fergus[4] has observed a rapid weak pulse, frequently intermittent, which cannot depend upon eyestrain alone.

It is known that the cones of the macular region are chiefly concerned with central vision in good illumination, losing their function in the dark. In semi-darkness the rods in the peripheral portion of the retina function most efficiently and the best vision in this condition of illumination is obtained through the peripheral parts of the retina. The illumination in many English mines has been very poor. Ninety per cent of the light falling on the coal face is absorbed and the amount of light entering the eye is sometimes as low as 1/500 of a foot candle[5]. (An illumination of 4 foot candles is considered necessary for a seamstress.) Under such conditions there must be no central vision to speak of and the constant effort over a long period of time will give rise to undulatory movements.

There are some who believe a large neurotic element enters into the disease[6]; others have advanced the theory of a microorganism[7]. The condition is unknown in the mines of America, South Africa, and some parts of England and Scotland.

That prolonged use of normal eyes under poor illumination may cause nystagmus seems to be indicated by the experiments of Bartels[8] who induced nystagmus in dogs by confining them in a twilight room for 65 days. After the nystagmus had been well established for 5 weeks he cut the optic nerve in 2 of the animals. This resulted in a gradual decrease of the nystagmus until 8 days later there remained only the oscillations of blindness. The author concludes that a certain amount of light sensation is necessary for the production of nystagmus, since complete exclusion of light caused it to cease.

There is a type of nystagmus which belongs neither in the ocular nor vestibular class. This is the hereditary type which exists without any gross pathological lesion demonstrable. It has been seen in certain families for 3 or 4 generations, sometimes affecting males only and in other cases, females.

Nettleship[9] divides hereditary nystagmus into two classes. (1) Nystagmus associated with head movements with affection of males and females and continuous inheritance of the defect. (2) Nystagmus with no head movements with affection of males only and inheritance through unaffected females, similar to color blindness and haemophilia. In the first group the nystagmus was horizontal and varied and rapid in extent. Head movements tended to diminish with age. In both groups there was poor vision, with marked ametropia, usually hyperopic astigmatism. There were many albinos in each group. There was no evidence of congenital nerve disease and no consanguinity.

Evans[10] reports a case of nystagmus in a

woman aged 55. It was of lateral springing type and there was no visual defect. The patient stated that her father and paternal grandmother had the same condition. The patient had 6 children—5 girls and 1 boy. The son had marked nystagmus, the daughters none. The son's infant daughter had nystagmus. Hence in 5 generations there was nystagmus alternating in male and female without any ocular pathology demonstrable.

Many unusual types of nystagmus have been reported. Verhoeff[11] gives the following explanation of a case of unilateral nystagmus with squint: At first there is a cortical lesion probably congenital in origin which tends to produce nystagmus of both eyes. This is associated with but independent of an absence of binocular vision which leads to squint. Owing to the fact that one eye is used for fixation its tendency toward nystagmus is fully compensated for. On the other hand, the squinting eye never being used for fixation, its tendency toward nystagmus is allowed to become manifest.

Paton[12] reports a case of a man who could produce nystagmus of the springing type voluntarily, doing it much better in bright daylight than in twilight. The vision was 20/20 in each eye and no pathology could be found.

Hird[13] reports case of a boy aged 10 years with normal vision who showed a slight lateral springing nystagmus with both eyes open. When one eye was closed the nystagmus of the other eye greatly increased with a corresponding decrease in visual acuity to 6/60.

Runge[14] studied 34 cases of alcoholism and found that nystagmus and incomplete ocular paresis can occur after consumption of large quantities of alcohol.

Other toxic agents have been known to produce nystagmus temporarily, such as chloroform, veronal, arsenic, lead, quinine, ergot and carbon di-sulphide. This is the springing type due to central action.

Occupational nystagmus, other than miner's nystagmus, has been observed in workers who are in the habit of watching fast moving machinery. Also among people who have to use their eyes in a constrained position under defective illumination, such as compositors.

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PREVENTION OF PNEUMONIA

With the height of the pneumonia season ahead of us it is worth while to turn our attention to the prevention of the disease, and the following rules published by *Hygeia* should prove useful:

"1. Don't allow young children to be exposed to persons with colds.

"2. Build up the resistance of the body. This may be done by careful adherence to proper health habits, such as adequate diet, regular outdoor exercise, plenty of sleep, the avoidance of overheated rooms and personal cleanliness.

"3. Dress for the weather. In cold weather wear plenty of warm clothing. Do not wear heavy clothing in warm rooms. Do not change from one temperature to another without changing the amount of clothing. If the baby sleeps in a cold room, as he should, remove the heavy clothings when you move him into the heated part of the house. When shopping in well-heated stores remove your heavy wraps. If your clothing gets wet, change as soon as possible and keep exercising until you can change. If you feel yourself getting chilled, exercise until you get warm.

"4. Don't neglect a cold. Probably more pneumonia has resulted from neglected colds than from any other single cause. Take care of a cold now, not tomorrow. If you feel a cold coming on, take a hot bath, a hot drink and go to bed immediately with sufficient covers to bring about free perspiration. On arising take a brisk rubdown and avoid becoming chilled. If the cold persists call a physician. If you have a cold, use separate toilet articles, towels, wash basin and drinking glass.

"5. Take the utmost care of persons recovering from debilitating disease, especially measles and whooping cough. Disease greatly lowers the vital resistance. It takes some time, usually several weeks, after the disease has disappeared for the resistance to return to normal. During this time the patient should take great care not to do too much. The convalescent should not return to a normal routine of life without the advice of the physician."

BULLETIN ON SILICOSIS

The Bureau of Industrial Hygiene of the New York Department of Labor has recently issued a bulletin comprising a resume of the literature of Silicosis. This bulletin is available gratis to any physician applying for it to the Director, Bureau of Industrial Hygiene, New York State Department of Labor, 124 East 28th Street, New York City.

Case Records
of the
Massachusetts General Hospital

ANTE-MORTEM AND POST-MORTEM RECORDS AS USED IN WEEKLY CLINICO-PATHOLOGICAL EXERCISES

EDITED BY
RICHARD C. CABOT, M.D., AND HUGH CABOT, M.D.
F. M. PAINTER, A.B., ASSISTANT EDITOR

CASE 12121

MEDICAL DEPARTMENT

Miss E. B., 14, single, born and living in Massachusetts.

She had an operation for ruptured appendix eight years ago. This was drained. She has since been troubled every two to three months by a dull, aching, crampy pain in the region of the navel lasting about a day, severe enough at times to keep her awake, but not to make her groan or double up. It does not radiate. These attacks are usually unaccompanied by nausea. The temperature is normal. There is no history of chills or sweats. In the interval between the attacks there are no gastro-intestinal symptoms. The appetite is usually good. There is no distress after eating. The bowels move daily.

Six days ago she was waked at midnight by severe epigastric pain lasting for about four hours. It was severe enough to double her up and make her groan. She was given one-third of a grain of morphia. There was relief from about four a. m. to eight a. m., when the pain recurred and lasted all of that and the next day, in paroxysms lasting about five minutes and recurring about every five minutes. Three days ago she was very little troubled in the morning, but the pain recurred after 2:00 in the afternoon and has been almost constantly troublesome since—recurring every five to fifteen minutes and lasting about five minutes. The pain is, as before, referred to the epigastrium, is of a sharp, cutting character and severe enough at times to make her groan and keep her awake. It is not severe enough to double her up and does not radiate. It is not increased by long breath. For the past three days she has vomited with each attack. The vomitus has never contained blood or food eaten previous to the last meal or had a stercoraceous odor. She has taken very little food since the onset six days ago—hardly more than one-half pint of liquid food in twenty-four hours, taking small amounts at frequent intervals. She states that she is very weak. Her urine is scanty and high-colored. The bowels have moved daily with an enema. The stools have been light brown, partly formed and fair in amount; no blood has been noted. She is said not to have passed gas. No tenesmus. She has slept very little since the onset. Her temperature has been subnormal, 96°-99°, for the past two days. There is no cough or headache. The past history, habits, and family history are negative.

On examination she was well developed and nourished. The expression was not anxious or pinched. The skin and mucous membranes were of good color. The skin was dry. The pupils were equal, regular and reacted readily to light. The neck was not stiff. The glands were not enlarged. The tongue was dry and coated. The hands and feet were cold. The teeth were in good condition. There was no lead line. The lungs showed nothing abnormal. The heart was not enlarged. The sounds were regular and of good quality. No murmurs were heard. The pulmonic second sound was equal to the aortic second sound. The rate was 90. The abdomen was soft, tympanitic. There was slight general distension, and slight tenderness in the epigastrium. There was no visible peristalsis. There was a recurring loud, amphoric gurgling sound throughout. There was no hernia. There was a scar of an operation wound in the right lower quadrant. No abdominal masses were felt. There was no evidence of abdominal fluid. Pelvic examination showed the cervix perpendicular to the axis. The uterus was not felt. the culs-de-sac were free. The blood pressure was 120/80. The reflexes were normal. Catamenia was present.

The blood smear showed no apparent leucocytosis. There were 60 per cent. of polynuclear cells and 40 per cent. of lymphocytes. The vomitus was about eight ounces of greenish material with a finely divided sediment at the bottom. The urine showed a slight trace of albumin, sugar absent, specific gravity 1.028. The sediment contained many blood cells and a rare polynuclear cell.

DISCUSSION

BY FREDERICK T. LORD, M.D., AND DANIEL F. JONES, M.D.

NOTES ON THE HISTORY

DR. LORD: Errors in diagnosis of abdominal disturbances are for the most part due to the omission of essential information regarding the evolution and grouping of symptoms and inadequate characterization of individual symptoms. The most important symptom in most cases is pain. An important feature in this case is a drained appendix operation eight years ago. During the subsequent period there have been attacks of crampy pain of no great severity referred to the region of the navel, with complete freedom from gastro-intestinal symptoms in the intervals. The present attack began six days ago, and there has since been inconstant severe colicky epigastric pain with vomiting, inability

to pass gas and weakness. Daily stools and absence of fever are noteworthy. No blood has been noted in the stool. The vomitus is not fecal. Weakness may be ascribed to starvation. Pain, vomiting and inability to pass gas are sufficient to make a tentative diagnosis of intestinal obstruction from the symptoms alone. A daily stool, without gas, is not at variance with this diagnosis. Such combinations occur as no gas and no stool, gas and no stool, stool and no gas. Here it may be assumed that persistent failure to pass gas is a consequence of incomplete obstruction, the heavier fecal matter sinking into the obstruction and the gas rising above the level of the opening.

NOTES ON THE PHYSICAL EXAMINATION

The dry tongue and skin, cold hands and feet, and cardiac rate of 90 may be ascribed to insufficient intake of fluid and food. There are general abdominal distension and slight tenderness in the epigastrium. Absence of visible peristalsis and tumor is noteworthy. The gurgling sounds are of no special significance other than that they indicate active peristalsis and are such as may be heard over any abdomen at some time during the day. Do you agree to that, Dr. Jones?

DR. DANIEL F. JONES: I think they are of special significance other than that they indicate active peristalsis. I think we ought to be able to distinguish with the stethoscope between normal peristalsis and a partial or complete obstruction in most cases.

DR. LORD: What is the difference between the normal and that which we hear in obstruction?

DR. JONES: Normal peristalsis is a very mild peristaltic gurgle, while that in intestinal obstruction is much more "amphoric" as you call it, is much louder, and gives the impression of the intestine trying to force material along.

DR. LORD: It seems to me that usually the peristaltic sounds are as you say not loud and are insignificant compared to what was heard here. Since Cannon (*Am. Journ. of Physiol.* Vol. XIV, Oct. 2, 1905, No. IV) called attention to the normal rhythmic sounds produced by the stomach and intestines I have often listened over the abdomen of patients with and without abdominal disturbances. It is obvious that there is considerable variation in the intensity and quality of the rhythmic gurgling sounds both in health and in disease. I have records of my findings in four cases of intestinal obstruction proved by operation. In three of them there were gurgling sounds to my ear indistinguishable from the normal rhythmic sounds. The fourth case is the one under discussion, in which they were loud and amphoric. But it seems to me that at times in normal persons and at times also in tympanites without intestinal obstruction the gurgling sounds are as loud as in this case, and I am in consequence doubtful about the special significance to be attributed to such sounds as an indication of obstruction. Is there another aspect to the matter? Does the absence of gurgling sounds indicate that the condition has gone on to paralysis?

DR. JONES: Yes, that it has gone beyond the active stage, which is very important.

DR. LORD: It might be said that as time goes on these conditions do tend to become paralytic.

DR. JONES: That is true of the small intestine, not of the large. In large intestinal obstruction the peristaltic movements continue apparently until the patient is moribund, while in the small intestine the peristaltic movement ceases much earlier.

COMMENT ON SPECIAL INVESTIGATIONS

DR. LORD: The Wassermann test is lacking, but there is no suggestion of syphilis. Blood in the urine is probably due to the catamenia and a catheter specimen seems unnecessary. Examination of a stool is desirable, but none is at the moment obtainable. A barium meal and X-ray of the gastro-intestinal tract would be likely to furnish valuable information, but is contraindicated with the complex of symptoms which this patient presents. Do you agree to that, Dr. Jones?

DR. JONES: I certainly do, and hope it will be made stronger in some way in the notes. Because I think it is a very serious error to give a patient with partial obstruction a barium meal. I think we are very likely to convert a partial obstruction into a complete obstruction and to be forced to operate at once whether we want to or not.

DR. LORD: Does it interfere with the operative procedure?

DR. JONES: Yes. It fills the intestine with barium, which is rather sticky and interferes with the line of sutures.

DIFFERENTIAL DIAGNOSIS

DR. LORD: Pain, vomiting, inability to pass gas, and distension, in the absence of evidences of general peritonitis, indicate intestinal obstruction. A duration of six days with fair general condition and daily stool suggest that the obstruction is incomplete. Mesenteric thrombosis is a possibility, but is likely to cause marked leucocytosis, fever and bloody diarrhea. Paralytic ileus from general peritonitis is excluded by the soft abdomen, in connection with a reasonably good general condition of the patient.

DR. JONES: Yes.

DR. LORD: Lead poisoning, tuberculous peritonitis, renal stone, gall bladder disease, peptic ulcer and acute pancreatitis are to be considered, but rejected as unlikely explanations.

Site of the obstruction: Localization is usually difficult. Absence of visible peristalsis of a

suggestive "pattern" adds to the difficulty here. Bile in the vomitus and the negative rectal examination exclude the beginning and the end of the gut. Is the small or the large bowel involved? The only available evidence bearing on this point is the probable nature of the obstruction. The chances with any obstruction are much in favor of either constriction or intussusception, and the absence of tenesmus, tumor and blood in the stool favors constriction. Constriction usually occurs in the small bowel.

DR. JONES: I should say that the localization of the pain was of great assistance in localizing the obstruction, in that localization of the pain at or below the umbilicus means obstruction of the large intestine, while localization of the pain above the umbilicus practically always means small intestinal obstruction.

DR. LORD: Passage of a rectal tube, estimation of the quantity of fluid which can be passed into the large bowel or inflation with air are no longer customary procedures because of the lack of importance in the determination of the exact site compared with the discomfort to the patient and the danger of rupturing the bowel. Such methods of localizing an obstruction in the large bowel are now discarded in favor of X-ray examination after a barium enema. Even this is not to be considered in this case on account of the loss of time it would entail. Fluoroscopic examination alone might have shown distended loops of intestine indicating the site of the obstruction.

Condition of the bowel: Whether there is here simple obstruction or obstruction plus extensive vascular disturbance (strangulation) is hard to say. The duration of six days, lack of severe toxic symptoms and the absence of leucocytosis suggest that there is little interference with the blood supply. As shown by Foster and Hausler (*Arch. Int. Med.* 34, 1924, p. 697) with simple obstruction dogs live three to eight days and collapse symptoms do not develop until the last day, while with interference with the blood supply (strangulation) there is profound shock and death usually in less than thirty-six hours.

Nature of the Obstruction: It is usually impossible with certainty to determine the cause of the obstruction. The absence of tenesmus, bloody stools and abdominal tumor make intussusception unlikely. Excluding intussusception, constriction by bands and cords, twists, obstruction by gall-stones or by stricture or tumor are especially to be considered. Of these possibilities the numerical chances greatly favor constriction, and this diagnosis is rendered more probable by the history of a drained appendix operation.

Outlook with intestinal obstruction without operation: Acute intestinal obstruction is one of the gravest emergencies. Practically all patients with constriction and with twist die unless relieved by operation. The outlook for intussusception without operation is more favorable. Recovery without surgery appears to occur in about one-tenth of the cases. (Hess, *Arch. Pediatrics*, Vol. 22, 1905.) This estimate is based on reported cases, and it is to be expected that more favorable than unfavorable cases find their way into the literature. A reasonable doubt also may be entertained regarding the diagnosis of intussusception without operation or autopsy. Though the invagination may be relieved there is still the danger of peritonitis, recurrence of the intussusception, and stricture of the gut after separation of a slough.

If you suspected intussusception in a patient seen within two days of the onset would you resort to efforts at reduction?

DR. JONES: No, I should not resort to efforts at reduction after the first twelve hours.

DR. LORD: And how long would you persist in the efforts at reduction?

DR. JONES: As a matter of fact I would not persist at all. I would not make any effort to reduce it. You asked me whether in case I suspected intussusception I would persist as long as forty-eight hours.

DR. LORD: I am assuming that it is practically hopeless to attempt to correct an obstruction other than an intussusception.

DR. JONES: Yes, and I would not even attempt to correct an intussusception by any of the known methods except operation.

DR. LORD: Even while waiting to operate?

DR. JONES: Even while waiting to operate. That may be radical, but I would not do it.

TREATMENT OF INTESTINAL OBSTRUCTION

DR. LORD: The most important single factor in successful treatment is early resort to operation. In my series of twenty-one cases of intestinal obstruction seen in consultation outside the hospital the earliest surgical intervention was within thirty-two hours of the onset, and in this case the bowel was already gangrenous and resection unsuccessful in saving the life of the patient. My experience in and out of the hospital suggests that delay in operation is the chief cause of the high mortality in this group of cases. The unsuccessful trial of non-surgical measures during the first few days of the illness is likely to bring the patient to operation at a time when surgery is incapable of affording relief. I do not believe that time should be lost in the attempt to overcome the obstruction by lavage, irrigation of the large bowel or inflation with air. Cathartics should not be used. No food should be given. Morphia should be withheld until the diagnosis is established.

Scudder (*Transactions New Hampshire Med. Soc.* 1908) published an analysis of 121 cases of acute intestinal obstruction from the Massachusetts General Hospital Clinic 1898-1917, with a

general mortality of 60 per cent. A second series of 118 cases occurring in the following ten years was studied by Richardson (*Boston Med. & Surg. Journ.*, Sept. 2, 1920) with a mortality of 41.5 per cent.

In the case under discussion immediate operation is indicated. Dr. D. F. Jones operated, and will tell of his findings. The post-operative convalescence was uneventful, and the patient has since remained well—now one year and eight months after operation.

DR. JONES: As to the diagnosis of this case, it seems to me that a preliminary diagnosis should be made on the ground that the patient had been operated upon. I believe that in any acute abdominal condition in a patient who has been operated upon the diagnosis of intestinal obstruction should be made until some other diagnosis can be determined upon.

Post-operative intestinal obstruction is so serious that I have considered telling every patient who leaves this hospital following an abdominal operation that he is liable to intestinal obstruction, and that if he has abdominal pain any number of years after operation he should seek the services of a surgeon at the earliest possible moment.

In this particular case, in spite of the fact that she had been operated upon, a surgeon of considerable experience had not even considered intestinal obstruction. The story is absolutely complete in every particular in this case. In the first place, there is the operation. In the second place, there were definite attacks of colicky pain repeated at varying intervals. The last attack had been going on for six days with epigastric pain coming on at intervals of from five to fifteen minutes, with nausea and vomiting. This is an unusually easy case in which to make a diagnosis of intestinal obstruction. In many post-operative cases, especially within a few days following operation, the diagnosis of intestinal obstruction is very difficult, so difficult that many of us feel that not infrequently patients die of intestinal obstruction because a diagnosis cannot be made. In very ill patients the abdominal pain is almost entirely absent. There is nausea, a sense of fullness, rarely any severe distension, and nothing else to be made out. If the obstruction is high the patient vomits and relieves the higher portions of the small intestine, the enemata empty the lower portions of the small intestine. There is therefore no distension.

As to the condition of the intestines in this case, the patient had a movement every day. I think it is very doubtful if this patient had very much of a movement every day. It usually takes but a few hours to empty the bowel completely below an intestinal obstruction. The passage of gas is much more important than the passage of fecal matter. If the patient can pass gas there is no great hurry about operating. It makes very little difference whether the patient has a good fecal movement or not.

I think it should be carefully noted that in small intestinal obstruction the patient frequently has severe colicky pains during the first few hours of the obstruction, and that it is impossible in many cases to get a history of colicky pains out of the patient unless he is asked directly as to the character of the pain in the early stages of the obstruction. In the great majority of cases of complete small intestinal obstruction the patient complains only of a constant pain in the abdomen, in spite of the fact that definite peristaltic waves can be seen crossing the abdomen.

As to the operation in this particular case, a band was found running from the anterior abdominal wall to the ileum and from the ileum to the mesentery of the ileum. The band had contracted to such an extent that it made a direct pull upon the ileum and upon the mesentery of the ileum, and had almost completely shut it off. That it had been the cause of the previous attacks of pain is shown by the amount of dilatation of the small intestine above the band.

DR. LORD: Could not that be due to the present attack?

DR. JONES: No. I think one attack could not dilate it to that extent. If the patient had had only one attack of obstruction the intestine would not be dilated to the extent it was.

DR. E. L. YOUNG: Was it a hypertrophied bowel?

DR. JONES: Yes.

DR. YOUNG: Doesn't that usually mean a chronic condition?

DR. JONES: Yes, hypertrophied and dilated. A very important point in operating on these patients is to relieve the obstruction if possible without eviscerating the patient. Evisceration is fatal in a very high percentage of cases of intestinal obstruction. In the case of bands it is usually easy to find the obstructing band without allowing any of the intestines to get out of the abdomen. The question of resection did not come up in this case because the blood supply was not interfered with in any way. It might be given as a general rule that if resection is necessary suture would better not be done. There are exceptions however to this rule. In advanced cases of small intestine obstruction it is usually best to do a jejunostomy under local anesthesia and make no attempt to find the obstruction. It is frequently necessary to do a jejunostomy after relief of the obstruction.

DR. YOUNG: Will you say a word about the anesthetic? Don't you think that is important in any intestinal obstruction?

DR. JONES: The anesthetic in this particular case was ether, because the condition of the patient warranted the use of ether. If possible

these cases should be done under local anesthesia. We believe that in many of the very ill patients a spinal anesthesia is better than a general anesthesia. Gas-oxygen and ethylene anesthesia are preferable to ether in cases in which the operative procedure can be carried out under so light an anesthetic.

DR. OSCAR RICHARDSON: Is there any time that you can set, after obstruction is established, when it is too late to go in?

DR. JONES: The mortality in intestinal obstruction of course depends entirely upon the length of time elapsing between the onset of symptoms and the operation. As to the number of hours within which the operation must be done, that is impossible to set, because in the first place it depends upon where the obstruction is, whether in the large or small intestine; if in the small, as to whether it is low in the ileum or higher up. The higher up the obstruction the earlier must be the operation. Then again, the result depends upon the amount of interference with the blood supply to the intestine. Dr. Lord has mentioned a case with a fatal outcome after thirty-two hours. That patient should have been operated upon within six hours. The severity of the pain at the outset, it seems to me, is a very good guide as to the necessity of operation. The case which Dr. Lord speaks of as being fatal had very severe pain at the onset of the attack. Another case which I saw on the third day required one-half grain doses of morphine during the first twelve hours of the intestinal obstruction and practically nothing after that. In this last case, upon opening the abdomen nothing but black intestines could be seen everywhere.

DR. READ ELLSWORTH: This case had no leucocytosis. How important do you consider that in differentiating between acute intestinal obstruction due to intussusception and one due to mesenteric thrombosis?

DR. LORD: I should not think it was very important except as between the constriction, making a distinction between constriction and strangulation. In simple constriction there is likely to be no leucocytosis. In strangulation there is likely to be.

DR. JONES: Very high leucocytosis would be another indication for early operation because of the evident interference with the blood supply.

DR. YOUNG: How often do you think that dehydration alone would give the leucocytosis, from persistent vomiting and low intake?

DR. JONES: I have no idea.

DR. YOUNG: I have thought that in certain cases where dehydration was very marked the leucocytosis was apparently due to it.

DR. JONES: That might be in acute dehydration, if there is such a thing. In acute hemorrhage there is no diminution in the red cells, so in what might be called acute dehydration there would be an increase in both red and white cells.

DR. ELLSWORTH: In a very obese person is the stethoscope on the abdomen not a very valuable aid? We do not use it very much in the medical wards at present.

DR. JONES: The use of the stethoscope on the abdomen is very rarely seen. There are only a few men in this hospital who use the stethoscope on the abdomen in such cases, but when one gets used to it I think one finds it very useful indeed. For instance, I went into the ward a short time ago to see a case in which there was a question as to whether a man had a peritonitis or intestinal obstruction or a simple paralytic ileus and nobody had attempted to make a diagnosis. There was not a single sound to be heard in the whole abdomen after listening for a long time. It seemed to me that that ruled out intestinal obstruction very definitely. That plus the absence of any definite tenderness ruled out peritonitis. We were therefore left with paralytic ileus as the cause of the distension.

DIAGNOSIS

Intestinal obstruction by bands of adhesions involving the small intestine.

CASE 12122

SURGICAL DEPARTMENT

A German carpenter sixty-six years old entered the hospital July 31. His complaint was that his bowels moved only once in three or four days, though he passed thick liquid several times a day. Eighteen years before admission he had chills and fever for one day. For ten years he had had bleeding piles. For eight years he had been slightly deaf, chiefly in the left ear. For three years he had had tinnitus of the left ear. Three years before admission he had rheumatism in the left shoulder, elbow, wrist and fingers, leaving his fingers gnarled, though motion was not much limited.

Thirteen months before admission he had diarrhea for a week with six stools daily, weakness, and loss of appetite. A month later he had a similar attack. After both of these attacks he felt perfectly well. Three months later alternating diarrhea and constipation began and persisted. For three or four days he would pass thick liquid matter three to eight times daily, more frequently upon exercise. Then he would pass large quantities of firm feces in small lumps. He said that he was conscious of the feces collecting in the intervals, and that after one of these large movements he had pain beneath the umbilicus. Since the diarrhea and constipation began his appetite had been very poor and everything he ate caused quantities of gas, relieved somewhat by peppermint water.

For nine months his bleeding piles had been worse. Five months before admission he had cramps for five days, occurring about two hours after dinner, severe enough to double him up, but lasting only a minute or two. Four months before admission he had X-ray examination with a barium enema. Since that time he had urinated three times at night and ten or twelve times by day. He stopped work at this time, chiefly because of weakness, and had been in bed or in a chair most of the time. For the past two months he had had hunger pains three hours after each meal relieved by crackers and milk. Six weeks before admission for a period of two weeks he was nauseated for about twenty minutes after meals. Passage of gas relieved him. Several times he regurgitated sour, bitter material. There had been no vomiting. At about this time he became yellow all over for two days. Fruit juices and sour things caused more gas than other foods. Two weeks before admission he had two black stools followed within an hour by blood. He had a sound in the left ear like crickets, and for a month or two had often heard a "blup" sound in that ear synchronous with the heart beat. Since this came on he could hear better with that ear, but not so well with the right. He thought he had lost twenty pounds in the past year and more than twelve pounds in the past four months.

Examination showed an emaciated old man with dry scaling skin showing scattered seborrheic areas over the back and chest. There was a right deviated septum with partial obstruction. The teeth were decayed and foul, with many missing. The throat was injected. The chest was of the long ptotic type. The lower anterior chest was depressed. The apices were retracted and showed impaired resonance with increased voice and breath sounds. The heart showed no enlargement. The action was regular, the sounds poor. A soft systolic murmur was heard at the left of the sternum. The artery walls were palpable. The temporals and brachials were tortuous. The blood pressure was 140/70 to 125/65. The abdomen was of the pot-belly type. The left inguinal ring was relaxed. In the left lower quadrant was a nodular movable mass, probably feces. There was slight separation of the recti below the umbilicus. Rectal examination showed a very large hard mass high in the rectum anteriorly, covered over with papillomatous nodules, movable and not very tender. The examining finger was bloody. The sphincter was slightly relaxed. There were external hemorrhoids. The pupils and reflexes were normal. Fundus examination showed the disc borders very hazy and the vessels sclerotic.

Before operation the amount of urine was normal when recorded, the specific gravity 1.020. The sediment showed six to ten red blood corpuscles and 4-5 leucocytes per high power field. The hemoglobin was 70 to 60 per cent., the leucocytes 11,400, polynuclears 68 per cent., reds 4,600,000 to 4,320,000, smear normal. A Wassermann was negative. The coagulation time was eight minutes. The clot retraction was good. The icteric index was 3.

X-ray showed a peculiar abnormality of the upper and lateral portion of the left acetabulum. The greater portion of the pelvis was obscured by the opaque material in the bowel. It was impossible to make a diagnosis. A plate of the chest was somewhat over-exposed, though as far as could be determined the lungs showed no definite evidence of metastasis. The aortic knob was very prominent, indicating arteriosclerosis.

Before operation the temperature was 97.5° to 100°, the pulse 65 to 101, the respiration normal.

August 6 operation was done. The patient did very well until early the morning of August 10. Then he complained of some pain over the precordium, became cyanotic, and a few minutes later died.

Discussion

BY EDWARD L. YOUNG, JR., M.D.

The statement that he passed "thick liquid several times a day" is at once suspicious.

"Bleeding piles" is one of the most dangerous diagnoses that can be made in surgery for various reasons. One is that it is often made without examination, when in fact the disease is higher up and may even be malignant. The second is that disease higher up does often cause piles, and the diagnosis made without careful examination may miss the more serious condition.

It is extraordinary the amount of punishment some people will stand before they report for help.

Nothing more is said about the examination with barium enema. I assume that it was made outside and that it was unsatisfactory.

Hunger pains relieved by crackers and milk I think is an interesting observation, because up to this point of course we are thinking first of malignant disease in the lower bowel, second of colitis going on to a severe ulcerative type; and here we have a symptom which is almost pathognomonic of duodenal ulcer,—a hunger pain essentially.

That he became yellow is also important if true. It is very difficult always to be sure of the statement about a patient's being yellow, because often when we ask the question they say yes, meaning a sallow complexion due to a run-down condition. Of course real jaundice means something, and that sallowness means very little.

It seems very much as though this was an open-and-shut case so far as diagnosis is con-

cerned. Of course the mention of as definite a mass as that means tumor, and inasmuch as at that age a mass of that size could be but one thing, I do not think we can discuss any other diagnosis than carcinoma of the lower bowel.

He shows surprisingly little in the hemorrhoidal line to account for bothersome hemorrhoids for ten years. A picture of a man in late life—at least late according to his physical examination, though he is only sixty-six years—with a very serious condition which has existed for a long time. On the face of it it seems as though there was very little chance of curing him. Is it possible that he has had a colitis for ten years and that this condition has developed on the chronic irritation of the lower bowel? It is of course possible, but hardly probable. I do not of course mean that he has had carcinoma for ten years. But I think he has had it for thirteen months and perhaps longer, and I think it is probably inoperable.

We do not see the man, and the question of operation depends on a good many factors. In the first place he is entitled to a look-in to see whether the thing is curable. If it is not, it will probably close down pretty soon, and the colostomy done at that time will relieve symptoms. Or it may do what an exploratory colostomy sometimes does, it may put him out of trouble, which I think ought to be checked up on the credit side rather than the debit side of the surgeon. The basis for operation is of course that we cannot spoil a bad egg, and what would be done would depend on what was found. And if the patient's condition was as bad as I get the impression it was from reading this record, the only thing to do would be a colostomy, because anything further would kill him.

Alternate constipation and diarrhea is a sort of textbook sign, due to two factors: (1) The pressure of the tumor which causes an abnormal congestion and behavior of the bowel, so that there are periods of spasm and collection of fecal material with constipation, and that swings over the line with the irritation to spasmodic movements and diarrhea. (2) The explanation of passing a lot of liquid is that behind every obstruction there is a collection of two different types of fecal material. One is the hard material in the outer part of the bowel lumen, and a thin, foul, and very toxic collection of feces in the center, so that the liquid material which he passed was the center type, with every now and then small amounts of the other type.

DR. YOUNG'S PRE-OPERATIVE DIAGNOSIS

Carcinoma of the lower bowel.

PRE-OPERATIVE DIAGNOSIS

Carcinoma of the rectum.

OPERATION

Ether. Left rectus muscle splitting incision. On exposing the abdomen no masses could be felt in the liver. There was a large mass involving the rectum, almost filling the pelvis, and apparently firmly attached. The loop was drawn up, a glass rod inserted through the mesentery, and the peritoneum stitched around the loop of sigmoid, making a colostomy.

FURTHER DISCUSSION

In other words it was a grossly inoperable situation, and all they did was a colostomy.

This death may mean a pulmonary embolus or it may mean nothing that Dr. Richardson can discover.

DR. RICHARDSON: Did he die suddenly?

DR. YOUNG: He died very suddenly, and in a way consistent with pulmonary embolus.

CLINICAL DIAGNOSIS (FROM HOSPITAL RECORD)

Carcinoma of the colon.
Probable embolus.
Operation, colostomy.

DR. EDWARD L. YOUNG'S DIAGNOSIS

Carcinoma of the rectum.
Pulmonary embolism?

ANATOMICAL DIAGNOSIS

1. *Primary fatal lesion*

Colloid adenocarcinoma of the rectum.

2. *Secondary or terminal lesions*

Pulmonary embolism.

3. *Historical landmarks*

Colostomy.
Slight arteriosclerosis.
Chronic pleuritis, left.

DR. RICHARDSON: The head was not examined. The abdomen was slightly distended and the wall rather tense, but there was no fluid in the peritoneal cavity and no definite peritonitis. The skin and mucous membranes were rather pale, and in the region of the left lower quadrant was an operation wound, I presume the colostomy.

The stomach and small intestine were frankly negative. The large intestine however was markedly distended and contained a great amount of soft brownish fecal material. The mucosa at the upper part of the rectum was negative; then along a length of ten centimeters there was a definite and extensive mass of new growth tissue extending into the wall, and on its inner aspect cauliflower-like and infiltrated with colloid material,—a typical carcinoma of the rectum, colloid in type.

There was nothing in the mesenteric glands.

The retroperitoneal glands, although in one or two places slightly enlarged, did not show any new growth tissue either macroscopically or microscopically.

The lungs showed some edema but no areas of consolidation. The pericardium and heart were frankly negative. There was a slight amount of arteriosclerosis, and the pulmonary artery in its first portion contained considerable blood and blood clot, massed up there in coils and extending down into the primary branches. These coils showed small branches in instances, and altogether it was a perfectly typical embolic mass, pulmonary embolism.

The prostate showed a small so-called middle lobe, but there was no definite obstruction to the urethra.

CASE 12123

Urological Department

An English business man of thirty-four entered June 8, 1925. March 1, three months before admission, he had sudden profuse hematuria lasting thirty-six hours, then gradually decreasing, but not clearing for a long time. Five weeks before admission he had a second profuse attack lasting eighteen hours, then clearing to a smoky color. There were some clots with both attacks. The blood was mixed with urine in a homogeneous fluid. Six days before admission he had a third much milder attack starting in the evening. By morning the urine was normal in appearance. During the past two months he had lost about five pounds.

He had one attack of malaria (?) in India, 1916-1918, lasting only over night. He took quinine. Since that time he had had five or six attacks of "chills and fever" lasting only over night.

Previous studies in the Consultation Clinic showed a residual of twenty-one ounces, cloudy, specific gravity 1.017, a very slight trace of albumin, sediment loaded with pus, blood and colon-like bacilli. The external genitals and prostate were negative. Cystoscopy showed considerable generalized redness, several places much inflamed, mostly on the posterior wall; several streaks of redness with mucus and some old clot adherent; walls very lax, so that two syringefuls did not smooth it out. Trigone and ridges red, left side somewhat more than the right. No papillomata or other causes of bleeding seen. The catheter passed easily up both ureters. The right drained clear urine. The left urine was slightly smoky or cloudy from the start. The flow was good on both sides. Urine from the left kidney showed occasional red blood corpuscles, occasional degenerated epithelial cells, a few amorphous urates. Urine from the right kidney was slightly alkaline, showed rare red blood corpuscles, occasional degenerated epithelial cells and a few amorphous phosphates. Both ureteral specimens were negative for tuberculosis. X-rays showed the kidney outlines indistinct on both sides in all plates taken. No abnormal shadows were present. After the injection the pelvis of the right kidney was fairly well shown. It lay a considerable distance from the spine. The calices were irregular. No evidence of dilatation of the pelvis. The deformity of the upper calices and the position of the kidney suggested an infection in the upper pole.

May 15 catheterization after voiding gave fourteen ounces of residual, smoky urine, specific gravity 1.028, a very slight trace of albumin, sediment loaded with red blood corpuscles and bacteria.

Examination in the wards June 8 showed a fairly well developed and nourished man lying comfortably. Scattered over the trunk, arms and legs were many slightly raised broad brownish-red scaling papules a half a centimeter to two centimeters in diameter. There was slight swaying in Romberg. The examination was otherwise negative.

Before operation the chart was normal except for one rise of pulse the day of the cystoscopy. The amount of urine is not recorded. Seven specimens, one a catheter specimen, showed specific gravity 1.030 to 1.010, a trace to the slightest possible trace of albumin in all. Sediment of three loaded with red blood corpuscles. The other four showed 10-100 red blood corpuscles per high power field. Six specimens were loaded with leucocytes. Special search failed to show tubercle bacilli. Blood examination showed 6,800 to 8,200 leucocytes, 74 per cent. polynuclears, 90 per cent. hemoglobin, reds normal, platelets increased at one of two examinations, normal at the other. Bleeding time four minutes, clotting time 6, 7, 8, 9 minutes. A Wassermann done in the Consultation Clinic was negative. Lumbar puncture showed no evidence of block, no gross chemical evidence of abnormality.

The patient had hematuria with no pain and no symptoms of bladder irritation. A urological consultant advised catheterization and bladder lavage twice a day for a few days. This was done without difficulty; the residual was 250 c.c. on June 14, 400 c.c. on June 16. The urine continued bloody.

June 18 cystoscopy was done, and June 23 operation. The patient made an excellent convalescence except for a severe spinal puncture headache. By July 6 he was voiding without trouble. That day there was less than half an ounce of residual. Next day there was none. The wound was filling in. July 8 he was discharged.

Discussion

BY GEORGE GILBERT SMITH, M.D.

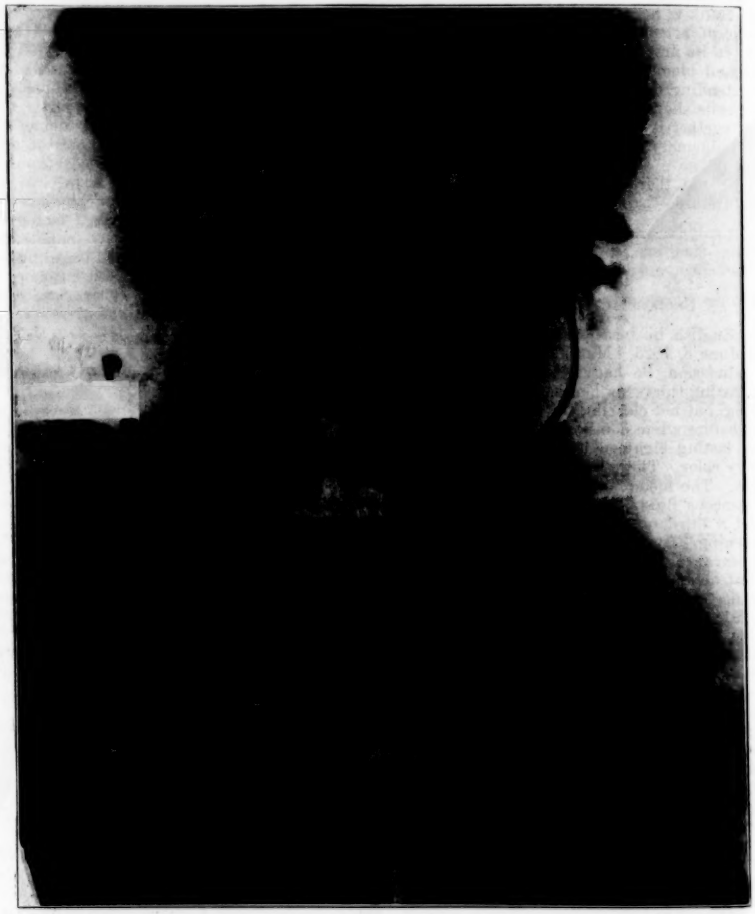
This man entered really on the medical service. What is the indication on this history—

I do not mean the diagnosis, but what ought the doctor to do?

A PHYSICIAN: Urinalysis and cystoscopy.

DR. SMITH: Yes, cystoscopy. Every case with blood in the urine should be cystoscoped sooner or later. In some cases with cystitis it may not be wise to do it at once, but every case that bleeds should at some time have a cystoscope inserted into the bladder to make sure that there is no tumor. A cystoscopy done with a small fifteen observation French cystoscope is practically without any upsetting effect, and gives very valuable information.

In the light of the later history it is fair to think that these attacks of chills and fever were of urinary origin.



The kidney outlines are indistinct on both sides. No abnormal shadows are present. The pelvis of the right kidney is fairly well shown. It lies a considerable distance from the spine. The calices are irregular. There is no evidence of dilatation of the pelvis. The deformity of the upper calices and the position of the kidney suggest an infection in the upper pole.

Isn't it very unusual for a man of thirty-four to have a residuum of twenty-one ounces,—in fact to have any residuum at all? What are the possible causes?

A PHYSICIAN: A large prostate, gonorrheal in origin.

DR. SMITH: A great many men have gonorrhea, but very few ever have retention from the effect of that on the prostate. Of course there may be acute retention from acute prostatitis in gonorrhea, but that is a matter of a few days and accompanied by other symptoms of acute infection.

A PHYSICIAN: Stricture?

DR. SMITH: That is something that might cause it, but it is very seldom that we find this amount of residuum behind a stricture unless there has been a long period when the man has had difficulty in voiding. Would a normal bladder hold twenty-one ounces comfortably? Not as a rule. Yet here the man had a retention of twenty-one ounces.

A PHYSICIAN: It is a case of retention of urine.

DR. SMITH: Not of complete retention, because this amount is said to be residuum.

A PHYSICIAN: I should think it was neurological.

DR. SMITH: Yes, tabes. There is not much in the way of local symptoms, but a large amount of residual urine. Tabes may occur in women, it is well to remember, though not so often. It is perfectly possible for a woman to get a tabetic retention.

A PHYSICIAN: Isn't thirty-four too young for tabes?

DR. SMITH: No, I should not think so. We may get tabes in a child as a result of congenital syphilis.

I should say that there might be two causes for the residuum in this man: either an interference with the reflex action of the bladder which would be due to a neurological condition such as tabes, post-diphtheritic paralysis, certain lesions of the cord such as transverse myelitis, or interference with nerve roots as in spina bifida occulta; or there would be some local cause. Now for local cause: with this history of bleeding, tumor of the bladder overlying the orifice would be probably the best guess. The history of bleeding and retention is very suggestive. He is much too young for adenomatous change in the prostate. He might have in the posterior urethra some of those congenital folds which have been described which have caused partial retention all his life. Another condition, which I think is about the rarest, but is the one that we thought he had, is a stricture of the bladder neck, that is, a sclerotic condition of the prostate where it surrounds the internal orifice.

Cystoscopy ruled out some of these conditions. Of course with tuberculosis we should not expect to find residuum but just the opposite, in other words a very small, contracted bladder, although this is not necessarily true. I have had some patients who had quite large bladders with tuberculosis and died of the tuberculosis without any marked difficulty with the bladder. Here are the X-rays of the kidneys.

A PHYSICIAN: Does "irregular" mean blunted calices?

DR. HOLMES: No, it simply means that the outline was not smooth, it was notched. This plate shows the catheters in position, and we can see faintly the outline of the kidney on either side. We are not justified, I think, in saying definitely whether a kidney is enlarged or not, but so far as we can see this is normal. There are many chances for error.

Here is the plate taken after the injection. This is the right side and this the left. The pelvis of the right kidney was injected, and as noted in the text, the distance from the catheter to the spine is considerably greater than usual.

DR. SMITH: It was the left kidney that the blood came from. The right had a normal flow.

DR. HOLMES: I do not know how to explain this distance of the kidney from the spine. Apparently it is not due to a much dilated pelvis.

A PHYSICIAN: What about that spine?

DR. HOLMES: It is normal so far as I can make out from this plate. It has a little curvature, but that may have been due to his position on the table. The kidney seems to be a little rotated, so that we are looking at the edge instead of the side. In the extreme upper pole of the kidney we notice that the calices instead of being smooth and clear cut are ragged and irregular in outline. Usually that means ulceration or inflammatory changes in the calices. I think it is also possible that when the injection is put in under considerable force some of it works through and gives this appearance, particularly if it is a damaged kidney.

DR. SMITH: It is unfortunate for the sake of completeness that we did not have ureterograms on both sides, which would probably have shown dilatation, with the longstanding obstruction below, even if the pelves did not show dilatation.

A PHYSICIAN: Can you rule out a kink with this?

DR. SMITH: No. One reason why we did not follow this up a little more carefully is that it seemed to me when I saw this patient on the medical service that his trouble was primarily in his bladder, and that the difficulty with his kidneys was secondary. That is, he had a seriously infected bladder urine and no reason why he should not have had a pyelitis with nibbling of the calices and even dilatation. Both the ureters showed dilatation, and I would not have been surprised if both the pelves showed it also.

The most important condition to rule out would have been a tumor of the left kidney, and probably the man who saw him in the Out-Patient Department meant him to have his pyelogram done on the left side.

I think this skin condition proved to be psoriasis.

We did everything we could to rule out tabes, and seemed to rule it out.

The X-ray showed no spina bifida occulta,

which is another thing which should be borne in mind as disturbing the function of the bladder.

With daily catheterization this man's residual decreased very definitely. His urine continued somewhat bloody, but he had marked cystitis and probably a pyelitis with bleeding undoubtedly from the mucous membrane.

After going over all the possibilities here as thoroughly as I could, it seemed to me the probable cause of his retention was a tightness at the bladder neck. His bladder tone seemed fairly good. As yet we have no instrument for measuring accurately the tonicity of the bladder, but there is a paper on the Dallas program in which Dr. D. K. Rose is going to present an instrument for this purpose which would probably be useful in such cases as this. I received also an article the other day from Dr. Thomas Moore of the Mayo Clinic on the attempt to determine the sensibility of the bladder by trying the effects of heat and cold and the effect of touching the mucosa with a catheter with a bead in the end and with a little needle in the end. He has found that bladders in certain abnormal conditions of the nervous system show a distinct lack of sensibility. That may be a very great help and will teach us that if the bladder sensibility is grossly disturbed there is no need of removing an apparent obstruction, because the bladder will probably behave no better afterwards. We did not know these helps to diagnosis then, and so it seemed to me that the type of the retention was mechanical.

CYSTOSCOPY JUNE 18

There was obstruction to a soft rubber catheter at the bladder neck. The cystoscope passed without difficulty. The bladder wall showed trabeculation and saeculation even with complete distension. There were areas of reddish color in the mucosa, but no definite lesion which the urologist could recognize. The ureters looked normal. The posterior urethra was deeply congested, large and smooth, purulent looking material exuding from the ducts. Operation was advised.

PRE-OPERATIVE DIAGNOSIS

Contracture of the bladder neck.

OPERATION

Spinal novocain and ether. A curved preanal incision was made and carried down until the membranous urethra was exposed on a sound. Denonvillier's fascia was then incised and the base of the prostate exposed by dissection. The finger in the rectum at this time showed that there had been no injury. An incision was made on each side of the verumontanum. The sound was then removed and the neck of the bladder explored. After the prostate had been drawn down it was found to be contracted and fibrous, so with a Young's punch a number of bites were taken out of the neck of the bladder. This increased the size of the orifice considerably. A urethral catheter was put into the bladder and stitched into place, and a large perineal tube. The bladder was then irrigated well and the wound closed with No. 2 continuous catgut.

PATHOLOGICAL REPORT

Microscopic examination of a few small pieces shows increase in muscle tissue and some glandular hyperplasia. No malignancy.

Further Discussion

Spinal puncture headache is believed to be due to the leakage of spinal fluid through the hole in the dura into the soft tissues, so that the spinal pressure is lowered.

He was discharged fifteen days after his operation. That is fairly good time for a prostatectomy to get out. These perineal prostatectomies do tend to get out a little quicker than the suprapubic.

Rather an important contribution to this history is the later history of this patient. I have seen him within a week or so. He came back once or twice, had sounds passed, and his bladder washed out, and then I told him he need not come back unless he had trouble. He began to have bladder irritability a month or two ago, came back, and we found that he had a small amount of residual. Once it got up to eight ounces, and several times it was one or two ounces. We started him on weekly passing of sounds and washing his bladder out, which seemed to relieve him. I think that it will be necessary for him to have sounds passed and to have the bladder washed, because there is a tendency of the bladder neck to contract, and it is very difficult to get rid of the last bit of infection when a man has a bladder which has been overdistended for a long time. The wall becomes indented with little saccules, and we can never get it smoothed out so that it empties itself. I think mercurochrome is very valuable in the treatment of these cases.

On the same service we had an Italian of forty-two who had retention. I did a total prostatectomy on him. I was suspicious of carcinoma. The specimen did not show carcinoma, but showed a fibrous, contracted bladder neck. This year I have seen another man of about thirty-four with some residuum — one and a half ounces—due to tight bladder neck. So that is a condition we must bear in mind and consider as one of the causes of pyuria and disturbance of micturition. In this case the picture was a good deal complicated by the bleeding, which was a little more than we should expect. But this patient has not developed a renal tumor or anything in his bladder, and he has not had any more bleeding. So I think it is fair to say

that the cause was overdistension and infection of his urinary tract.

A PHYSICIAN: What is the explanation of the etiological process here?

DR. SMITH: I think it is infectious, not necessarily gonorrheal. We are seeing more and more patients who have a non-specific prostatitis. I think that may be a factor. Also I notice that in the few cases I have seen this condition has occurred in individuals of highly nervous temperament. As soon as we do anything to them they go into spasm. I am inclined to think that they have a certain spasm of the bladder neck, which while it is not the entire factor, adds to the contracture caused by inflammation. Sometimes when relaxed they will be very much more comfortable and will void well, and another time, if excited, they cannot pass a drop.

A PHYSICIAN: How is the hematuria explained?

DR. SMITH: I think by the ulcerations due to the infection, ulceration in the kidney pelvis and also of the bladder mucous membrane. Then the excessive distension of the bladder would open up those ulcerated areas and let them bleed.

DIAGNOSIS

Stricture of neck of bladder of inflammatory origin.

MATERNITY RISKS IN MASSACHUSETTS

SOME interesting facts relating to maternal welfare were brought out at the monthly meeting of the Boston Health League by Doctor Coffin of the State Department of Health.

In an endeavor to get additional light on this problem the Mass. Department of Public Health made a study of 984 deaths occurring in 1922-23 of women six or more months pregnant and who died within a month of delivery (with the exception of 53 who died undelivered near term). These women died from causes related to pregnancy or childbirth. The total loss of life of both mothers and children was 1414 for the group studied.

This study was carefully made by three physicians, who taking the records as furnished by the Register of Vital Statistics, first interviewed personally the physicians who signed the death certificates, also visited the hospitals and in a considerable number of cases the homes.

It is interesting to note that 723 of these mothers died in hospitals and 84 after delivery at home. Of course, it must be stated that a large proportion of this group were rushed to hospitals as emergencies and many of them were moribund on admission.

Chief among the causes of death were septicaemia, toxaemia and hemorrhage, all of which are regarded in a large measure as preventable.

From the study made certain needs stand out, chief among which are:

1. The need of more careful reporting of maternal and infant deaths with more complete records.
2. The need of careful study of every case of septicaemia. An intensive study of the first case occurring either in hospital or private practice might prevent a series of cases, as well as be of aid in determining methods of prevention in future deliveries.
3. Adequate prenatal care with clean and skillful obstetric service for every mother in the State, so that the "risk" of becoming a mother and of being born may be cut to the lowest figures possible. This calls for the coöperation of doctors, nurses, hospitals, medical schools, private organizations and the general public.
4. By incessant teaching and demonstration this need must be brought home to all especially concerned.

AN INVESTIGATION OF THE EFFECT OF WARFARE GASES

AT the request of the American Legion and other agencies, General Frank T. Hines, director of the U. S. Veterans Bureau, upon the recommendation of Dr. Crossman, Medical Director, has appointed a Board of Medical Officers to conduct an investigation and make an intensive study of the residual effects of warfare gases.

The members of this Board are:

Dr. A. K. Krause, Member of the Group on Investigation and Research of the Medical Council of the U. S. Veterans Bureau and Associate Professor of Medicine at Johns Hopkins University.

Lt. Col. Harry L. Gilchrist, M. C., U. S. A., Chief of Research Division, Chemical Warfare Service, United States Army.

Dr. Philip B. Matz, Chief, Medical Research Sub-division, United States Veterans Bureau.

This Board held its first meeting March 9, 1926, at the U. S. Veterans Bureau and it was decided to begin the investigation at once. This will necessitate the study of the present status of some 70,000 men who were gas casualties during the World War, and will extend over a period of 12 to 18 months.

Outside of the knowledge obtained from experimental work on animals very little is known about the remote effects of the various war gasses on the body economy. This investigation is purely a scientific one, the findings of which will be not only of clinical value to the ex-service men and the Veterans Bureau, but is being looked forward to with a great deal of interest by some of the other governmental departments.

U. S. VETERANS BUREAU.

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AN EXAMPLE OF POPULAR JOURNALISM

WHEN the popular journalist gets hold of a medical subject he is much too prone to "promote" the theory and "sell the idea". In his desire to "put his story across" he is likely to make statements which appear ridiculous to the man of scientific training, and which arouse grave suspicion as to the veracity of the rest of the article. Such a write-up appears in the March 13th issue of "*Liberty*" under the title "Science Can Make You Grow Younger"; it purports to give the personal experiences of Dr. Adolph Lorenz following the Steinach operation, which was performed upon him some five years ago.

The value of this operation—ligation of the vas deferens—is doubted by many, probably by most, members of the medical profession. That there is an apparent increase in the interstitial cells following vasoligation may be true, but Oslund* has shown that this phenomenon occurs after certain infectious diseases in which the seminiferous epithelium is destroyed, and that it is due to edema of the intertubular tissue. The interstitial cells spread out within their enlarged confines, but it is very doubtful whether they actually increase either in number or in the amount of their secretion. The clinical improvement, which is alleged to follow the operation is difficult to estimate; one can only point out that it is the sort of feeling of well-being which may be brought about entirely through mental influences. Even granting that an enhanced sense of vitality does result, no one with any knowledge of pathology can let pass without challenge the statement made by Judge Limley, the author of the article in question, that "when your arteries commence to harden, a surgeon can restore them in a few minutes, slicing off years with a knife".

Not only is this article marked by a flashy style and exaggerated statement; it is as well a most flagrant piece of advertising for one Dr. Harry Benjamin of New York, "one of America's foremost specialists in the Steinach operation". The writer quotes rather freely from Dr. Benjamin, whether from a personal interview or whether from an article of Dr. Benjamin's on this subject is not stated.

The cost of the operation, which is described as "extremely delicate", is given as from $200—$500, a reward which we should be inclined to consider as rather more than commensurate for the amount of responsibility and skill required.

Without question it is proper to inform the public as to new developments in medicine. The public is interested—greatly interested—in such matters. For the magazine that endeavors to supply the people with such information, that makes this endeavor conscientiously, we have no criticism; when a periodical will publish such obvious pseudo-scientific bosh as the above, and with it will combine the most palpable advertising of individual doctors, we can only consider such an act as an abuse of its opportunities.

*Oslund, R.: Interstitial Cell Hypertrophy in Testis. Amer. Jour. Physiol., 69:589-598, Aug., 1924.

"TRUTH IN ADVERTISING"

THE JOURNAL on March 11 published an editorial under the title "Ethics in Advertising" in which it cited a list of objectionable patent medicine advertisements, all taken from the pages of one issue of a reputable Boston newspaper. The paper in question, as many will have surmised, was the *Boston Herald*. A further casual scanning of the pages of the *Herald* from day to day reveals a periodic publication of advertisements of Lydia Pinkham's Vegetable Compound and Lydia Pinkham's Pills for Constipation. One insertion draws attention, in a very touching manner, of two babies born in the year 1819 "whose lives were destined to have a far reaching influence." They were Queen Victoria and Lydia E. Pinkham.

The disciples of Lydia surpass the proprietors of practically all other patent medicines in this zeal for unethical advertising volume, but Carter's Little Liver Pills still crop up and "Prove

Mother is Your Closest Friend", and Hill's Cascara Quinine, in a rather startling headline claims to have paid $1,000,000 for its method of stopping colds with a remedy developed some years ago in a famous laboratory that announces its "creations" to physicians only.

After witnessing this broadside of seductive literature one reads a subtle note of irony into a modest insertion in the *Herald* which, under the heading "Truth in Advertising" continues, "We know that the advertising in this paper is fundamentally honest and sincere. But being only human, the most conscientious advertiser sometimes makes an inadvertent misstatement or inaccuracy. If you find any such, please report the case to us or to the Boston Better Business Commission." If the editors of the *Boston Herald* really believe that such a futile little smoke screen can hide their responsibility for their advertising columns they are to be pitied, not censured.

We crave indulgence for one more reference to the contents of the *Herald*. Very recently, in an editorial entitled "A Mail Order 'Gun' Did It," the *Herald*, with an admirable sense of the duty it owes to the protection of the public decries the ethics of a concern that sells lethal weapons by mail. "High class mail order houses," it states, "have abandoned this kind of business. Has not the time arrived to put a stop to it altogether?" The JOURNAL is firmly convinced that palliative patent medicines, sold largely as a result of their newspaper advertisements, do infinitely more harm than mail order guns. We would remind the *Herald* that high class newspapers have abandoned this kind of advertising. Has not the time arrived to put a stop to it altogether?

HONESTY THE BEST POLICY

THE policy of the JOURNAL has been to advocate and promote so far as possible the periodic physical examinations of supposedly healthy individuals. It believes that this function should become an important activity of the family physician. We were in complete accord with the effort recently made by the Committee on Public Health of the Massachusetts Medical Society in furthering this activity, and published with satisfaction the Handbook for Health Examinations by Physicians prepared by that committee.

It seems timely, however, in view of the universal propaganda that the subject is receiving, to determine just wherein lies the real value of this procedure and to place it where it rightly belongs in the scale of medical activities. A public little trained in the evaluation of health work and the accomplishments of medicine may well be led astray by the extravagant claims of enthusiasts for the health examination who are certainly creating the impression that this examination constitutes the *sine qua non* of longevity.

The health examination is important; it is one step in the direction of improved health conditions, but it is only one step and many are necessary. The layman is led to believe by the over-zealous proponents of health examinations that incipient disease is detected through its offices, and that the necessary environmental change may then be made to forestall the ultimate catastrophe. This is frequently true without question, but also it is frequently true that incipient disease is not and cannot be detected, and if found the examiner is often powerless to prevent its progression.

The Life Extension Institute in a recent advertisement states that heart disease, kidney disease, apoplexy, cancer and tuberculosis are preventable diseases. This statement is partly true but it is very largely untrue and much harm may result from allowing the public to believe that it is entirely true. Certain types of heart disease such as those due to syphilis are largely preventable, and we wish that we could prevent such types as the rheumatic and the arterio-sclerotic, and perhaps occasionally we can, but it is only occasionally. To some degree we may prevent kidney disease but our knowledge is decidedly too imperfect to allow us to make such conclusive statements in honesty to ourselves and our patients. Given arterio-sclerosis, the prevention of which is in the shadowy borderland of knowledge, we can never with certainty predict freedom from the dangers of apoplexy. Early cancer may be cured but it cannot be prevented. Tuberculosis alone offers some hopes of becoming a preventable disease although even with this infectious condition our efforts will often be met with failure.

The health examination is most decidedly a worthy objective, but in all honesty let us recognize its limitations even as we proclaim its virtues.

A NEW JOURNAL

THE first number of *The Quarterly Review of Biology* has just been received. Its *raison d'être* according to a foreword by the editor, Dr. Raymond Pearl, is "to help the man of science, whether biologist, chemist, astronomer, or devotee of any other *Fach*, to keep soundly oriented as to the general progress of biology" and to "help in the diffusion of sound knowledge about biological matters among intelligent men and women who are not professionally scientific workers." An ideal, it would seem, almost betwixt the devil and the deep sea.

The copy contains five articles of general biologic interest, one rather complete book review and numerous brief indications of the character, content and value of new books in the

various fields of biology. A sentence like, "The monotremes, most edentates, serenians, cetaceans, some proboscidians, and seals among carnivores possess complete or nearly complete abdominal testes" should certainly act as a mental cocktail on the "intelligent men and women who are not professionally scientific workers."

The Advisory Board is composed of fifteen men well known in thirteen different branches of biology. Under their guidance and with the able leadership of Dr. Pearl the journal should go far in accomplishing its avowed purpose.

THIS WEEK'S ISSUE

CONTAINS articles by the following named authors:

GARLAND, JOSEPH, A.B., M.D. Harvard Medical School 1919; Visiting Physician to the Children's Medical Department, Massachusetts General Hospital; Assistant in Pediatrics, Harvard Medical School; Member, New England Pediatric Society. His address is 270 Commonwealth Ave., Boston. Subject, "Maternal Nursing," page 519.

O'BRIEN, FREDERICK W., A.B., M. D. Tufts College Medical School 1911; Associate Professor of Roentgenology, Tufts College Medical School; Roentgenologist to the Cambridge Municipal Hospital and the Boston Sanatorium, and Visiting Roentgenologist to the Boston City Hospital; Member, American Roentgen Ray Society. His address is 465 Beacon St., Boston. Subject, "Cholecystography," page 522.

MACOMBER, DONALD, A.B., M.D. Harvard Medical School 1909; F.A.C.S.; Research Fellow in Obstetrics, Harvard Medical School. His address is 321 Dartmouth St., Boston. Subject, "Experimental Studies on Ovarian Function," page 529.

RACKEMANN, FRANCIS M., A.B., M.D. Harvard Medical School 1912; Instructor in Medicine, Harvard Medical School; Chief Medical Out-Patient Department, Massachusetts General Hospital. His address is 263 Beacon St., Boston. Subject, "Fatal Case of Asthma. Report of a Case with Autopsy," page 531.

VAN HOOK, WELLER, M.D. University of Illinois College of Medicine 1885; Formerly Professor of Surgery, Northwestern University, Chicago. His address is 31 N. State St., Chicago. Subject, "Strangulated Retrocolonic Hernia of the Ascending Colon and Caecum; Operation, Recovery," page 534.

HOLMES, ARTHUR D., B.S.; Ph.D Johns Hopkins University 1911; Teaching Record Laboratory Assistant, Dartmouth College 1905-1906; Instructor in Chemistry in University of Maine, 1906-1907; in Massachusetts Agricultural College, 1907-08 and Georgia School of Technology, Sept. 1911-Dec. 1911. Research Chemist, U. S. Dept. Agriculture, Dec. 1911-1918; Research Chemist, E. I. Dupont Co. 3 years and at present Director of Research, The E. L. Patch Co., Stoneham, which is his present address. Member, American Association for Advancement of Science and other societies. Associated with him is

PIGGOTT, MADELEINE G., B.S. Tufts College; Now with the E. L. Patch Co. The subject of their paper is "Studies of the Vitamine Potency of Cod Liver Oils. XIV. The Variation in Daily Food Consumption of Experimental Animals," page 537.

GAMMONS, HERBERT, M. D. Boston University School of Medicine 1909. Positions held: Assistant Physician, Massachusetts State Sanatorium, Rutland; Assistant Superintendent, Texas State Sanatorium; Superintendent, Dallas City County Tuberculosis Sanatorium; Instructor in Clinical Medicine, Baylor University Medical School; Tuberculosis Specialist, Veterans Bureau. His address is Booneville, Ark. Subject: "Non Pneumatic Lung Collapse," page 538.

DUNPHY, EDWIN B., M.D. Harvard Medical School 1922; Assistant Surgeon, Massachusetts Eye and Ear Infirmary; Assistant in Ophthalmology, Harvard Medical School; Ophthalmologist, N. E. Peabody Home and other institutions. His address is 520 Commonwealth Ave., Boston. His subject is "Nystagmus," page 539.

The Massachusetts Medical Society

PAPERS FOR THE ANNUAL MEETING

Fellows are requested to send the titles of papers they may wish to read at the Annual Meeting of the Massachusetts Medical Society, which will be held in the Kimball Hotel, Springfield, on June 8 and 9, 1926, to one of the officers of the appropriate SECTION. Do it now, before the official program is made up. The program, under the terms of the By-Laws, must be mailed to every Fellow a month before the meeting. The officers of the SECTIONS are:

SECTION OF MEDICINE: *Chairman*, W. H. Robey, Boston. *Secretary*, Maurice Fremont-Smith, Boston.

SECTION OF SURGERY: *Chairman*, J. M. Birie, Springfield. *Secretary*, H. P. Stevens, Boston.

SECTION OF TUBERCULOSIS: *Chairman*, A. S. MacKnight, Attleborough. *Secretary*, Randall Clifford, Boston.

SECTION OF PEDIATRICS: *Chairman*, R. M. Smith, Boston. *Secretary*, J. Herbert Young, Boston.

SECTION OF OBSTETRICS AND GYNECOLOGY: *Chairman*, C. E. Mongan, Somerville. *Secretary*, F. C. Irving, Boston.

SECTION OF RADIOLOGY AND PHYSIOTHERAPY: *Chairman*, L. B. Morrison, Boston. *Secretary*, F. B. Granger, Boston.

The street and number addresses will be found in the Directory of 1926.

WALTER L. BURRAGE, *Secretary*.

MISCELLANY

SMALLPOX IN LOS ANGELES, CALIF.

SMALLPOX has been reported as unusually prevalent in Los Angeles, Calif., during the last few months. 148 cases were reported in California for the week ending February 20. The type of the disease, which was mild during the fall, has become severe, and recent reports show a considerable number of deaths from the disease.

The commissioner of health of Los Angeles is endeavoring to interest employers of labor and others in a campaign for vaccination. With proper coöperation from the public, the epidemic will be short-lived.

DISCRIMINATORY LEGISLATION

DR. HARVEY W. WILEY director of the Bureau of Foods, Sanitation and Health of *Good Housekeeping*, has addressed to Senator Ellison D. Smith an open letter protesting against a bill recently introduced into the House having for its principal purpose the following:

1. Taxing margarine manufacturers $1,000 per annum.
2. Taxing wholesale dealers $1,000 per annum.
3. Taxing retail dealers $100 per annum.
4. Taxing uncolored margarine 10c per pound; retaining a tax of 10c a pound on colored margarine.

The evident purpose of the bill, Dr. Wiley points out, is to make it impossible to manufacture and sell oleomargarine. Oleomargarine is a valuable and acceptable food fat; the only stipulation is that it should not be sold as butter.

It is obviously unfair that this product should be taxed out of existence while millions of pounds of butter made from rotten cream by the neutralizing process should go untaxed. One agricultural industry should not be pitted against another in discriminatory legislation.

TRANSPORTATION RATES TO THE ANNUAL MEETING OF THE AMERICAN MEDICAL ASSOCIATION

THE circular of the Southern Railway giving information relating to the transportation to Dallas is as follows:

LV. New York 8:40 P. M.; AR. Memphis second morning 7:25 A. M. LV. Memphis via Cotton Belt 11:20 A. M.—Mo. Pac. 2:45 P. M.; Ar. Dallas via Cotton Belt 5:42 A. M.—Mo. Pac. 7:00 A. M.

Through Pullman sleeping cars are operated New York to Memphis where connection is made with through sleeping car either via Cotton Belt Route or Missouri Pacific. Pullman lower berth rate are as follows:

Lower berth rate New York to Memphis is $12.75. Lower berth rate Memphis to Dallas is $6.00.

Reduced rates have been authorized on above convention on straight certificate plan (full fare going, one-half fare returning) providing there are 250 delegates in attendance at the convention. These tickets with certificates are on sale April 15-21 inclusive certificate to be validated by special agent at Dallas April 19-23rd and honored for return ticket at one-half fare until April 27th.

Rate for round trip Boston to Dallas would be as follows:

Boston to Dallas	$65.79
Dallas to Boston one-half fare	32.90
	$98.69

QUOTATIONS MADE OF NOTHING

IN a letter printed on this page yesterday, Dr. W. W. Keen, who ranks among the country's great surgeons, told of a recent experience of his with the anti-vivisectionists. He and many other defenders of medicine and of science in general have had like experiences with those strange people.

He had noticed in a leaflet issued by them what pretended to be a statement from Dr. Borel of the Paris Pasteur Institute to the effect that, after fifteen years of using the knife on animals of many kinds, he admitted or asserted that the complete anesthetizing of animals was nearly impossible.

Dr. Keen knew that this was nonsense of which Dr. Borel could not have been guilty, but he wrote three times to Mrs. Diana Belais, President of the New York Anti-Vivisection Society, asking in what book or article Dr. Borel had made the assertion quoted. He received no answer. Then he wrote to Dr. Borel and promptly was informed that the French scientist never had made any statements even remotely approaching those ascribed to him—that he never had been questioned on the subject.

The fact is that animals are as susceptible to anesthetics as human beings and that they always are anesthetized before operations of any seriousness or delicacy, because without it they would be difficult or impossible.

Not long ago the anti-vivisectionists made a like misuse of Dr. Charles Mayo's name, and

The Times secured from him an indignant denial that he ever had been mad enough to declare animal experimentation useless. But they never apologize, never retract.—*N. Y. Times*, February 18, 1926.

ANNUAL REPORT OF THE BOSTON CITY HOSPITAL

THE report of this institution for the year ending January 31, 1925, has come to hand.

The total expenditures amounted to $1,686,737.04. Payments of patients for services rendered including receipts from the state and various cities and towns amounted to $173,503.83.

Space is given to very good descriptions of the new Out-Patient Building, the Thorndike Memorial and other departments. Plans for other additions have been approved and $1,146,602 has been expended. $750,000 has been appropriated for a new maternity building which will be located on the plot of land at the corner of Concord and Albany Streets. $250,000 has been appropriated for a research laboratory for the study of streptococcic infections.

The War Department has authorized the reorganization of the Hospital Unit formed during the World War designated as General Hospital No. 7. Dr. Dowling has been appointed commanding officer with the rank of Colonel. About twenty members of the medical and surgical staffs have received commissions.

The new X-ray laboratory has been named the Francis H. Williams Roentgen Ray Laboratory in honor of Dr. F. H. Williams in recognition of his valuable services extending over twenty years. All of the departments for the care of patients have been overcrowded so that in some departments patients have been unable to secure admittance.

More than eighty scientific papers prepared by members of the Staff have been published. There is also reported a long list of scientific articles read and addresses delivered by members of the Medical and Surgical Staffs.

21,409 patients have been admitted and 210,173 have been treated in the Out-Patient departments.

The mortality rate has dropped from .091 in the year ending January 1916 to .072 in the year ending January 31, 1925.

The report as a whole is impressive in the account of all features of hospital administration. It is clearly shown that much larger facilities are needed to enable this institution to meet the needs of those depending on it and that the City of Boston has great problems before it in caring for the sick and injured of this community which the Trustees will undoubtedly solve.

THE MASSACHUSETTS GENERAL HOSPITAL

THE Massachusetts General Hospital is not a State institution. It has been sustained and continued throughout its 105 years of usefulness by private gifts from generous, fine spirited men and women.

The Massachusetts General Hospital is a human institution and must either weaken, or grow stronger in service to meet constantly increasing demands made upon it.

The Trustees feel that an appeal to the citizens of the city and the State and generous givers beyond the State should rest not only on past records of achievement and on present needs, but also on the promise of greater service in the future.

Your own good gift and personal interest will be gratefully acknowledged by the Trustees and silently acknowledged in the hearts of those within our doors.

$3,250,000 NEEDED
for BUILDINGS
and ENDOWMENT *for Research and Education*

BULFINCH BUILDING

Fireproofing and Additions. When the improvements are complete, the Bulfinch Building will be safe from fire and 106 surgical patients, 94 medical patients and 40 children, a total of 240 patients, will be adequately housed with all necessary modern facilities.

HOSPITAL FOR PEOPLE OF MODERATE MEANS

This new branch of the hospital will be a great boon to people of mederate means in the community in their search for better health and better care in the time of sickness. The resources of this great institution will be made available for those who can pay a moderate amount for professional services and maintenance during illness. They will not be recipients of charity.

Mrs. Mary Rich Richardson has given $1,000,000 for the construction and equipment of this hospital. There is needed a further sum for endowment, the income of which will help to meet the operating expenses.

It is proposed to erect a building to house at the outset about one hundred and fifty patients and the nurses needed for their care. As the demand increases, and it surely will increase, it is planned to build a Home for the care of these nurses. This will enable us to replace nurses by patients in the hospital building so that it will eventually house about two hundred and seventy patients. This further development while sketched here is not a part of the immediate program.

OUT-PATIENT BUILDING

The pressure of patients, the necessity of space for the development of modern methods and the great need of a close physical connection between the Out-Patient Department of this hospital and the Eye and Ear Infirmary demand extensive building developments.

NEW WARD BUILDING

Although the community has grown rapidly, the hospital has added only a few beds in many years. The pressure upon it for admission of patients is great. The Ward Building will increase the capacity of the hospital by 150 beds.

The Modern X-ray and Radium Department calls for much space and expensive equipment. Last year 22,846 patients were treated in this department. This new building will provide the much needed space.

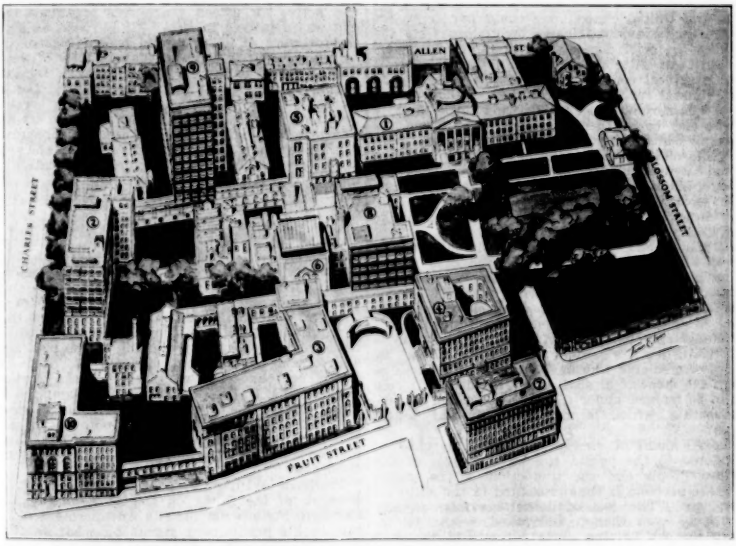
BOILER HOUSE

Engineers declare the present plant inadequate for heating and furnishing steam to existing buildings, kitchens and laundry. They further report that the present building is not large enough for modern boilers. An entirely new plant is needed.

RESEARCH

For the last thirty years or more, the progress of medicine has rested chiefly upon laboratory investigation. Here is made the diagnosis and the decision regarding the form of treatment, frequently including the surgical treatment. There are on record over 200 diseases, and it is only recently that the cause and satisfactory treatment for ten of these have been thoroughly established. There is yet a vast amount of research to be done in the great medical centers to complete what is now but incomplete knowledge. A large endowment is needed to maintain and increase the work of this important division of the hospital.

The illustration below shows the Hospital as it will appear after the proposed changes shall have been made.



Building No. 9 represents the new hospital for people of moderate means; No. 8 is the new ward building and X-ray department; No. 3 shows an extra story on the Out-Patient department; and the passageway between the Out-Patient building and the Eye and Ear Infirmary is also part of the proposed new construction.

CORRESPONDENCE

"WOULD THE DENTIST BE MORE ABLE TO HELP EITHER HUMANITY OR HIMSELF IF THE LETTERS AFTER HIS NAME WERE CHANGED?"

Mr. Editor:

As many inquiries are received at our office from physicians and dentists concerning the statements about the activities of our association, as referred to in your editorial entitled "Stomatology or Dentistry?" which was published in the BOSTON MEDICAL AND SURGICAL JOURNAL on December 3, 1925, I feel that an explanation is necessary, even at this late date, in order to eradicate from the minds of those who have seen fit to read into your editorial a meaning which was neither implied nor expressed.

To the careful reader it will be clear that the editorial begins very appropriately with the question of "Stomatology or Dentistry?" and concludes logically with another aspect of the same question: "Will the dentist be more able to help either humanity or himself if the letters after his name are changed?"

It is most fitting for a medical society to bring to the foreground those questions which are of vital interest to the public health and which concern the public. Stomatology has of late assumed national and international importance as it relates to the public health, and the BOSTON MEDICAL AND SURGICAL JOURNAL is to be highly commended in presenting for discussion this vital subject of interest to its readers and to the members of the Boston Medical Society.* However, in order to make a fair and just criticism, and more especially to pass judgment on the subject of stomatology and its educational problem in the United States, one could hardly be expected to make any conclusive deductions from the altogether too brief presentation of information contained in that editorial. The careful reader realizes that this subject could be but casually presented in such a limited space. It is for that small group of readers who may have overlooked this fact of brevity and who may be inclined to read into the discussion a meaning which is not there, that I offer this additional information. It is encouraging to note that the medical profession is concerning itself with stomatologic education and it is hoped that its impartial judgment will decide on "Stomatology or Dentistry" according to which of the two will serve the public health more efficiently.

As I understand this editorial it is intended to present, without bias, the facts in the case to the medical profession; namely, shall the "specialty of stomatology, which shall embrace diseases of the mouth and teeth," be developed or shall dentistry remain a profession "independent of medicine"? From an educational point of view, the question is raised "shall dentists become stomatologists," that is, "doctors of medicine who have specialized in the diseases of the mouth," or shall they (the dentists) continue to be trained under the present system of dental education, which is maintained in our dental colleges?

From the point of view of the health services to be rendered to the public, the large masses of the American people and the protection of the public health, the problem is thus presented in the editorial referred to: "The cost of dental services, already burdensome, even though warranted, would be increased, thereby driving more patients to the free clinics or leading them to neglect their teeth" if the changes in "the status of the dentist" is to be changed in accordance with the stomatological idea. Should such a change take place and should stomatology be established, the editorial maintains it "would in truth be deleterious to the public health."

In briefly presenting the two aspects of the problem, it is perfectly logical for the medical practitioner to raise the question "would the dentist be more able to help either humanity or himself if the letters after his name were changed?"

This problem of "stomatology or dentistry?" has a history and dates back to 1856, when the issues began to be formulated.* The question arose in France in 1892, when a law was introduced permitting, at that time, those not medically qualified to practice dentistry. In Italy, since 1892, the practice of dentistry has been limited to graduates in medicine. The attempt to introduce the D.D.S. degree in Italy, by a few opponents of the stomatologic idea, met with a failure. The law, which was introduced in 1923 in Italy, was repealed in 1924, and Italy again firmly upholds the stomatological idea of education and limits the practice of dentistry to graduates in medicine. In Hungary, the stomatological plan of education for dentists has been legally enforced since 1907. In Austria, dentists and physicians have again united and established the preliminary requirement of the medical degree (M.D.) before beginning specialization in dentistry.

Volumes I and II of the proceedings of the Associatione Stomatologique Internationale (A. S. I.), issued in 1908 and 1910, will furnish ample information pertaining to stomatology in Europe since the year 1907, when this international body was organized, representing 28 nations. This association included the Section of Stomatology of the American Medical Association. With regard to the attitude of educational leaders toward the stomatological plan of education of dentists, I wish to call your special attention to the Dental Faculties' Association of American Universities. This educational association was active for fifteen years, was organized in 1907, and was dissolved in 1924. Its purpose, as stated in the foreword of its published proceedings of 1924, is as follows: "It is believed that, in view of the forthcoming report of the Carnegie Survey of Dental Education, publication of the *Proceedings of the Dental Faculties' Association of American Universities* is peculiarly timely. From its inception to its dissolution this body had as its chief aim the consummation of the ideal now so strongly set forth in the synopsis of this report, that is, raising dental education to the university plane with the ultimate aim of placing dentistry on a par with any other specialty in medicine."

It is worthy of our attention to note that the late Dean of the Harvard Dental School, Dr. Eugene H. Smith, had expressed himself, in 1915, in favor of establishing a medical education as a preliminary requirement to the study of dentistry. It is apparent that the advocacy of the stomatologic plan of education for dentists is not a radical one and that for years the need has been felt for a merger of dentistry with medicine for the protection of the public health and for the advancement of dental science. The issue is not concerned with whether the dentist has the letters M.D. or D.D.S. after his name; the importance lies in his education, his point of view, his medical, biological outlook. To obtain such an outlook he must be trained in the medical college as was pointed out very recently by Professor Oliver T. Osborne.**

Professor William J. Gies, PhD., ScD., F.A.C.D.† Director of the Study on Dental Education for the Carnegie Foundation for the Advancement of Teaching, in his preliminary report on what dentistry is doing for the public and what it should do for the public, and also, what the dentist's training is, and what his training should be, says the following in speaking before the American Association of Dental

*Reference is probably meant to apply to the Massachusetts Medical Society.

*Vortrage uber Stomatologie, Central-Zeitung, 1856-1867.

**Oliver T. Osborne: Why should the Dentist Be a Graduate in Medicine? Review of Clinical Stomatology, January, 1926.

†William J. Gies, F. A. C. D.: A Further Discussion of Some Problems in Dental Education. Journal of the American Dental Association, November, 1924.

Schools on March 5-7, 1924: "Many mechanical phases of dentistry are now practised on a basis that is very largely empiric and in ways that are freely productive of pathologic consequences. Narrowness of education accounts for this superficiality. Scientific biologic knowledge and sound application of mechanical principles in dentistry are demanded by every consideration of faithful professional service. Such knowledge and such practice cannot be attained by men whose minds have not been prepared by suitable education to achieve them." Professor Gies goes on to say: "If dentistry becomes, as it should and as we hope, fully equivalent in service value to an oral specialty of medicine, dentistry will deservedly continue to hold its independent place in public confidence. If, however, dentistry will not or cannot grow into the efficiency of the equivalent of an oral specialty of medicine, public interest will require creation of an accredited specialty of medicine to render oral health service and will no longer look to dentistry for it. If dentistry fails to accept her present opportunity to become the equivalent of an oral specialty of medicine; and if, in that event, medicine, responsive to public needs, should create the specialty of stomatology; then, dentistry obviously and of necessity would be restricted to performance of the function of technical assistant to that specialty of medicine."

In the final report of 1924,* Professor Gies states: "The type of training afforded by most of the dental schools does not promise to make the practice of dentistry the health-service equivalent of an oral specialty of the practice of medicine, and important improvements in dental education are required generally for attainment of that objective."

Will the public be benefited if dentists are better qualified? By qualification is meant medical qualification. Dr. Owre,** Dean of the Dental College of the University of Minnesota, states definitely in answer to this question: "Yes."

The foregoing refers to the status of dental education and its services to the public health, as well as a careful analysis of the progress of dental education,† and well negates the assumption made, "though admittedly without definite knowledge of the subject, that at least nine-tenths of the work required of dentists is of such a nature that it can be performed with perfect satisfaction with the education already provided in good dental colleges."

It is dental educators who question the present status of dental education and it is also these educators who advocate new degrees and more years of study for dentists. For example, seven years of study for the D.D.S. degree instead of four or five years has been advocated. Dr. Guy S. Millberry, Dean of the Dental Department of the University of California, says in speaking for the university: "This university is now giving consideration to the adoption of a plan of maintaining a four-year course in dentistry leading to a B.S. degree and establishing or utilizing other courses that will lead to the D.D.Sc. degree at the end of seven years, with the M.S. degree available in course. Graduation at any point will entitle one to practice on passing the Board. It is no new policy in university life, being the normal in universities all over the world for centuries, and most dental colleges hesitate to accept the plan because they will thus sacrifice a noble title cheaply obtained."

When the seven-year course was opposed on the ground that "The important thing in training dental students is to teach them to be dentists," Dr. Millberry replied: "What or who is a dentist?" Dean Millberry, in support of his proposed seven-year dental course, replied to Dr. McGee's* criticism of the plan as follows: "You apparently approve of the facilities for higher education for the man who wants it, and that is just what this university is trying to do."**

In a similar manner, in 1923, Dr. A. W. Twiggar, in his presidential address before the Dental Society of the State of New York, proposed a change in the educational policy for the dental colleges of the State, which changes would make it possible for students in the medical and dental colleges during their first two years to interchange their plan of studies. According to Dr. Twiggar's plan: "With the interchangeable two-year course, the dental student can take two additional years and get his M.D. degree. (See Transactions of 55th Annual Meeting, May, 1923, p. 87.)

No one could reasonably consider that these educators or that a president of the New York State Dental Society would propose a change in the dental curriculum and advocate the M.D. degree for dentists because of his "feeling of social inferiority which is believed by some to attach to the profession of dentistry as compared with that of medicine has considerable to do with the desire to place the dentist on a plane with the specialist who has an M.D. degree." That the issue in question is not one of degrees or of the change of the letters after the dentist's name is discussed fully elsewhere.***

Mention is made in your editorial to the discontinuance of the Section of Stomatology of the American Medical Association, which "has been given up because of poor attendance." Dr. McGee† explains the discontinuance of the Stomatological Section of the A. M. A. on the ground that this Section was merely a duplication of the Surgical Section of the American Dental Association. We have called attention also to the confusion of the so-called stomatological activities of the Stomatological Section of the A. M. A.††

The American Stomatological Association has never had any connection with that section. *La Stomatologia*, of Rome, in its editorial comment of February, 1926, in speaking of the discontinuance of that section, states that it was really a "dental section" with a "stomatological name." Other reasons for the non-attendance of dentists and the discontinuance of the Section, as given by Dr. Martin Dewey in his editorial comment,††† are as follows: "The Section of Stomatology was woefully mismanaged according to the by-laws of the American Medical Association. The section at one time had an illegally appointed Nomination Committee which had the audacity to nominate two-thirds of their members for offices in the Section. When the attention of the chairman was called to the fact that the Nomination Committee must be composed of the Executive Committee, the Executive Committee followed the same procedure by nominating two-thirds of their members for offices in the Section. This action was so disgusting that many members of the Section withdrew and allowed it to remain in the hands of the 'Close Corporation' which succeeded in *running* it so badly that the Council on Scientific Assembly discontinued the Section."

The plan of education of the American Stomatological Association, the Three-Two Stomatological

*The Carnegie Foundation for the Advancement of Teaching, 19th Annual Report. The Status of Dental Education, p. 90.

**Alfred Owre: Medical Education for the Dentist. Review of Clinical Stomatology, March, 1925.

†Waite: The Progress of Dental Education. Department of the Interior, Bureau of Education, Bulletin, 1925, No. 39.

*Editorial, Oral Hygiene, February, 1924, pp. 227-230.

**Millberry. A Letter from California. Oral Hygiene, December, 1924, p. 1967.

***Asgis: The Necessity of a Medical Education and a Medical Degree for Dentists. The New York Medical Week, October 10, 1925.

†The Stomatological Section of the A. M. A. Oral Hygiene, August, 1925.

††The American Stomatological Association and the Stomatological Section of the A. M. A. The Review of Clinical Stomatology, September, 1925.

†††Editorial, American Medical Association Discontinues the Section of Stomatology. International Journal of Orthodontia, Oral Surgery and Radiography, XI-8, August, 1925, p. 776.

Medical Plan,* is purposed to meet the needs in the United States for oral *health* service, in conformity with the best knowledge available.

It is this need for a "limited number of doctors of medicine who have specialized in diseases of the mouth, to whom doubtful cases may be sent for consultation," which you recognize in your editorial that the American Stomatological Association is making every effort to meet by providing instruction in stomatology. So have others recognized the need of merging medicine with dentistry and the training of stomatologists accordingly. Stephen Rushmore, M.D.,** Boston, Mass., in an address to the alumni of Tufts College Dental School on February 11, 1925, says: "The trouble with the dentists of our day is that they separate too much the teeth from the body." To remedy this situation, he further suggests in the following statement: "Medicine and dentistry certainly are coming closer together. I look forward to the time when dentistry will be a specialty of medicine, because it can have its proper place, its proper function, only when it sees the part in the light of the whole."

The Association has nowhere in its literature either stated or implied, or in any shape or form "thought of imposing upon thousands of good dentists the necessity for undergoing further studies in order to gain a degree of M.D. which will not permit them to practice medicine."

The American Stomatological Association is a medical organization, composed of medical practitioners and medical specialists, including stomatologists, that is, dentists with a medical outlook. The educational plans of the Association are the result of coöperative efforts of both physicians and dentists who well recognize that during the transitory period necessary readjustments will need to be made in order to give those practicing dentists, who desire to do so, the means by which they may qualify as stomatologists.

It is only reasonable that dentists should be given an opportunity to qualify as stomatologists. No plan can be shown to be inadequate or inefficient without having been given a fair trial for a reasonable period of time, in order to show its benefits to the public health. The autonomous dental system of education, which is based upon the concept that dentistry can fully perform its public health function by remaining an independent profession was tried for over a period of eighty-five years and has failed to meet the public health service needs.

Until very recently there were no facilities for the teaching of stomatology to either dentists or physicians in the United States. In order to meet the public health service demand the American Stomatological Association has established the first school of Stomatology in America,† The Post-Graduate Medical School of Stomatology, Chartered by the Regents of the University of the State of New York in 1925, for those dentists who wish to qualify for the practice of Stomatology.

ALFRED J. ASGIS,
General Secretary, American Stomatological Association;
Secretary-General-Adjoint, International Stomatological Association (A. S. I.).
135 Elliot Place, New York City.

February 20, 1926.

Editor, Boston Medical and Surgical Journal:

May I comment on the letter of Dr. Bayley and the editorial footnote as published in the JOURNAL of February 18? While it has proven difficult in the past, and so continues, to change the term of dentist to stomatologist, the fact remains that the former is incorrect and must be so admitted by one who understands the meaning of the word. Inasmuch as many do not understand the term stomatologist I will use in this communication the common or garden expression, viz.: dentist. Dr. Bayley is either very unfortunate in his acquaintance with dentists, or extremely fortunate in escaping the knowledge of the grafters and blunderers in the practice of general medicine.

How does Dr. Bayley avoid the fact that diagnosis and treatment of Vincent's Angina, trench mouth, Periodontoclasia, and the like originated with the dentists? How did the knowledge of general infection from septic foci about the teeth reach the medical profession except through the dentists? To be sure, when they got hold of the idea they rushed it to the point of charging all obscure diseased conditions to the teeth, so that dentists had to finally put on the brakes or all teeth would have been lost.

Dr. Bayley cites cases of bad—yes, criminal—misjudgment. I ask you, Mr. Editor, where would we stop if we started to relate the mistakes of men in all branches of the healing art? The argument would seem to be for more education for all of us. As a matter of fact, we hear criticisms implying that certain specialists could be burdened with a little more medical education. I refer to discussions on postoperative treatment. This brings me to the "Editorial comment." Imagine saying that the ophthalmologist is burdened with a lot of knowledge not needed in his practice because such a large percentage of patients only need a refractionist! Sometimes in the innocent pursuit of a correct eyeglass a patient may get a diagnosis of a glaucoma or a nephritis. One might discuss all specialists along these same lines. Even a great brain surgeon must have studied some things in the medical school that do not come into his daily practice. Does he feel that he is burdened by such knowledge?

Thank Heaven there are intelligent people who seek in their dentist something more than a skillful worker in the jeweler's art. To be sure dentistry is not as far away from the artisan as medicine is from the barber, but do not let us forget what the barber's pole stands for. We will not sneer at that, for let me quote the late Dr. Cheever, that glorious man and surgeon, who said to me as he opened a patient's vein, "It's a pity we have got so far away from what is occasionally a very excellent treatment."

Dentistry (Stomatology) is a branch of medicine and should receive the foundational education that is given to other specialists.

Yours truly,

EDWARD C. BRIGGS.

March 12, 1926.

[EDITORIAL COMMENT: Readers of the JOURNAL who are concerned with the question whether or not dentists should be given a medical education and should be classified as "stomatologists" or specialists in oral medicine, will be interested in the views expressed by the writers of the two preceding letters. Dr. Briggs is Emeritus Professor of Dental Materia Medica and Therapeutics at the Harvard Dental School; Dr. Asgis is General Secretary of the American Stomatological Association. With their opinion that dentists should not be merely artisans, but should have a thorough grounding in the principles of general medicine, we heartily agree. Do they not receive such an education now in the better dental colleges? A glance at the curriculum of the Harvard Dental School shows that, during his four years' training, the student must pass courses in comparative and human anatomy, histology and embryology, chemistry and physiology, materia medica, pathology and bacteriology, therapeutics, physical diagnosis and principles of surgery, syphilology, neurology and

*The Three-Two Stomatological Medical Plan and the Dental Autonomous Plans of Education for Dentists. Atlantic Medical Journal, February, 1926.

**Stephen Rushmore: Dentistry: A Public Health Service. Journal, American Dental Association, February, 1926.

†Editorial, The First School of Stomatology in America. Review of Clinical Stomatology, January, 1926.

medico-dental diseases, in addition to numerous courses restricted to dental disease and technic. What benefit would accrue to the prospective dentist from learning how to pass a sound or to apply high forceps? The dental student knows that he is going to practise dentistry. The ophthalmologist or the brain surgeon probably has no idea, while in the medical school, as to what he will do after graduation. The medical course must include something of all the specialties, for otherwise no standard requirements could be set. If certain schools choose to offer seven-year courses for the education of the "stomatologist," well and good. There will undoubtedly be a demand for a certain number of men so trained. But that all dentists should be forced to accept a course two years longer than the present one still seems to us impracticable. They would have the right and the knowledge to practise medicine, it is true, but it would be a privilege which would be a fifth wheel on the cart.]

REPORTS AND NOTICES OF MEETINGS

MEETING OF THE MASSACHUSETTS PSYCHIATRIC SOCIETY

THE next meeting of the Massachusetts Psychiatric Society will be held at the Boston Psychopathic Hospital, Wednesday, March 31st, at 8 P. M.

The speaker of the evening will be Dr. Arthur H. Ruggles, Professor of Psychiatry at Yale University. He will take as his subject "Mental Hygiene and the College Student".

R. M. CHAMBERS, M.D., *Sec. and Treasurer.*

HEALTH UNIT—17 BLOSSOM STREET

IN accordance with the suggestion and wishes of the members of the West End Neighborhood Conference, a round table meeting was held at the Blossom Street Health Unit, on March 19, 1926, at 3:30 P. M. The following subject matter was discussed:

1. What other health or welfare services of benefit to the community can be added to the functions of the Blossom Street Health Unit?
2. Consideration of a plan to have a monthly luncheon meeting for health and welfare workers in the district.

Subjects suggested will be discussed at following meetings.

CHARLES F. WILINSKY, M.D., *Secretary.*

MEETING OF THE HARVARD MEDICAL SOCIETY

THE Harvard Medical Society held its regular meeting at the Peter Bent Brigham Hospital on Tuesday evening, March 9th.

Two cases were demonstrated. The first was a man, aged sixty-five, who entered the hospital with a fracture of the left lower leg. Four weeks before entry, he had been struck by a block of wood on this leg. It became red and did not respond well to local treatment, but he went back to work and was putting all his weight on the leg when it suddenly gave way. On admission the X-ray showed a transverse fracture, interpreted as pathological. There was some evidence of bone atrophy in this region. X-rays taken six weeks after application of the plaster cast, showed no callus formation and again at a later examination showed extension of the atrophic process. A month later the X-ray showed a small amount of callus formation posteriorly. A biopsy was done and no evidence of tumor was found. There was fibrous union between the fragments but no bony union. The bone itself was almost dead. The picture was consistent with the findings of Paget's disease but there was no evidence of Paget's in the skull.

In discussing the case, Dr. Starr of Toronto, stated that it was rare in his experience to see a fracture in Paget's disease. He suggested the diagnosis of osteitis fibrosa, but added that this might be only an early stage of Paget's. If the signs on the skull are lacking he calls it osteitis; if they are present—he calls it Paget's disease as a more or less arbitrary division.

The second case demonstrated was a nurse, aged 26, with a history of rheumatic fever in childhood. She had always been abnormally short of breath on exertion but got along well until the present illness.

On the evening before admission she was in swimming and was suddenly seized by a severe pain in the chest. She became markedly short of breath and had to be assisted from the water. On admission she showed dyspnoea, orthopnoea and cyanosis. Temperature 102. Pulse 110. Respiration rate 30. WBC. 15,000. Physical examination revealed typical signs of mitral stenosis and also consolidation of the lungs with the exception of the right lower lobe. This was confirmed by X-ray. The tentative diagnosis was broncho-pneumonia. Thirty-six hours after admission, the WBC. temperature and respiration were normal and two days after admission the signs of consolidation were entirely gone.

Dr. Frothingham in discussing the case, said he was inclined to think the disturbance in the lungs was purely mechanical and not an infection. In favor of infection are several cases reported from New York this year of pneumonia of very short duration. The X-ray findings were characteristic of broncho-pneumonia. The two other possibilities are (1) pulmonary edema resulting from the cardiac insufficiency; (2) frank hemoptysis—with blood coughed out into the bronchi and promptly gotten rid of.

Dr. Clarence L. Starr, Professor of Surgery at the University of Toronto, addressed the meeting on the subject of "Bone Inflammation". For a number of years Dr. Starr has been carrying on investigations on acute infections of bone. With regard to the anatomy of

this subject he pointed out that there were several points necessary to keep in mind.

(1) That the blood supply of the long bones comes from three sources.

(a) The nutrient vessel along whose distribution inflammatory conditions of the bone most frequently arise.

(b) The periosteal blood supply—the cortex is pierced by a large number of small vessels which run through the Haversian canals and anastomose with the nutrient vessels.

(c) The separate blood supply to the epiphysis.

Japanese workers came to the same conclusion with regard to the blood supply of the long bones.

It is not possible to produce necrosis of bone by cutting off one of these sources of blood supply. If this were so there would be necrosis of bone from every simple fracture.

(2) Another important anatomical fact to be considered in the study of bone infections is the attachment of the periosteum at the end of the diaphysis. Instead of extending over the epiphysis it dips into the junction of diaphysis and epiphysis and thus acts as a barrier to infection.

(3) The cortical bone is much thinner in the metaphysis. Near the epiphyseal line, it is almost as thin as paper. This is the region of least resistance to infection spreading from a focus within the bone. It is also the region of least danger, for if the infection spread in any other direction it would be likely to cause more serious damage.

Acute osteomyelitis is pre-eminently a disease of childhood. In Dr. Starr's series of 207 cases, the average age was 7 years. It is rare after the age of 18 or 19 when the epiphysis has fused with the shaft of the bone.

The disease is always secondary to a primary focus elsewhere in the body. In many cases an injury to the foot may be the primary focus. The organisms entering by way of the blood stream lodge in the bone lacunae in the metaphysis near the epiphyseal line, i.e., in the cancellous tissue. It never starts in the centre of the shaft as pictured in some of the older textbooks.

Slides were shown illustrating the normal structure of bone, the mode of extension of the infection and the microscopic changes in the bone. Autopsy findings in Osteomyelitis and findings in the bones of experimental animals affected with this disease, agree as to the mode of extension of the infection. In eighty per cent. of the cases the infection was entirely in the metaphysis. Occasionally with a very severe infection, an infected spot was found in the epiphysis. The infection extends from the metaphysis out to the surface of the thin cortex and then strips the periosteum. It may burst the periosteum and form a sub-cutaneous abscess. The infection does not spread from the endosteum to the medullary canal but rather from the periosteum by backing up through the Haversian canals. The fact that the infection beneath the periosteum is under pressure, makes it spread more easily in this way. The areas of infection in the medullary canal may be spotty and this is further evidence that it enters from numerous points through the cortex.

The X-ray is not of much value as a diagnostic measure in the early stages. Cases may have clinical symptoms for six days before the X-ray shows anything. A careful history is important in early diagnosis. Usually it is the history of a child who has had some infective injury. An infected blister is a common story. A large percentage of cases will give a history of trauma. Although the trauma may have been comparatively mild.

Experimentally one can twist the epiphysis of a pup enough to make it bleed without incapacitating the animal. It is quite possible for a child to do the same thing at play. This injured area in the bone forms a point of lessened resistance to infection. This region which has the greatest possibilities of trauma in the young is the part where infection most frequently begins.

The only constant early sign is pain. It may vary in intensity but is usually very severe and constant. Soon there are definite signs of toxemia. The usual picture is pain in the epiphyseal line accompanied by a point of tenderness in a child that appears toxic with increasing drowsiness. There is leucocytosis of 30000 to 40000. Redness, swelling and edema are signs which come late when the chance of saving the bone without sequestration is slight. In a suspected case, it will do no harm to make an incision down to the supposed focus. The periosteum and bone may show nothing macroscopically and yet a clear culture of staphylococcus or streptococcus may be obtained from the drillings. If frank pus is found on the surface of the bone it is well to make a chisel hole into the bone near the epiphyseal line to allow sufficient drainage.

It is not necessary to open the medullary canal in every case. Dr. Starr and his associates have shown that the medullary canal may be entirely free of infection and making a hole into it only favors the entrance of organisms. Once infection has started in the medulla it spreads along the inside causing a certain amount of endarteritis. With this interference with the blood supply inside, and the stripping of the periosteum outside, both sources of blood supply to the bone are cut off and it has to die and sequestrate. The X-ray is the determining factor in deciding when to interfere and take out the sequestrum. A tourniquet is applied above and enough involucrum is removed on

one side to allow the sequestrum to be removed as a whole. The involucrum gets its entire blood supply from the periosteum. It is therefore important not to strip off its periosteum during the operation to remove the sequestrum.

Dr. Starr illustrated some unusual cases of osteomyelitis on the screen. One case was a man aged 72 with a staphylococcus infection of the bone. Although mainly a disease of childhood osteomyelitis may occur at any age.

A boy aged 14 with a history of a blister on his heel had a marked swelling of the lower half of the femur. He had a slight temperature and leucocytosis. The appearance and X-ray picture of the swelling suggested sarcoma. On opening the thigh, a cheesy involucrum with a disintegrated cortex was found. Several had diagnosed the condition as sarcoma.

Dr. Starr does not think that the above method of treatment causes "metastases" of the infection. Out of his series of 207 cases 33 recovered after operation without sequestration. A large number of the cases showed a positive blood culture at one time or another, but only in 3 cases was there a true septicemia.

BOSTON MEDICAL HISTORY CLUB

A REGULAR meeting of the Boston Medical History Club was held at the Boston Medical Library, March 15, 1926. Dr. E. W. Taylor presided in the absence of the President.

Dr. Charles F. Painter presented a paper on "Shamanism." He said that the shaman was the medical man in a tribal organization. The general principle of a medical man to ward off evil spirits and thus avoid the disagreeable experiences of life is found throughout the history of all primitive peoples. Early man looked upon many inanimate objects as containing good or bad spirits. The bad spirits were appeased by gifts or exoreisms and it was the duty of the shaman to lessen the effect of the evil influences by guiding the people through ceremonies and rituals. Dr. Painter then traced the growth of this idea through the ancient history of Greece, Egypt, Palestine, Babylon, and Assyria down to the present time, laying special stress on the interpretations given to shamanism by the Greeks. He noted, especially, that all phases of folk medicine are the same in all early peoples in all countries.

Mr. Alfred Ela showed three books on "Shamanism" and allied subjects written in English by a Polish author, Dr. M. A. Czaplicka. She traveled extensively in Russia and Poland and in her books describes the medical practices among the more primitive tribes.

Dr. Fred B. Lund spoke on the "Anatomy and Physiology in Plato's 'Timaeus' ". He said that Plato, a contemporary of Hippocrates, had very broad interests, mainly along the lines of philosophy, astronomy, and mathematics. In the "Timaeus", which is largely a physiological treatise, he attempts to explain the creation of the world and of man. Dr. Lund read various extracts from a Greek translation showing how feeble an idea Plato had in regard to the functions of the organs of the body and their relations to each other, although his knowledge of anatomy was relatively good. Of special interest are the references in "Timaeus" to the "wandering uterus", a phenomenon associated with hysteria, and to the "sacred disease", epilepsy.

Dr. George Sarton spoke on "The Time of the Two Hippocrates". He laid emphasis on the extraordinary developments that were taking place in the fifth century B. C., not only in medicine but in geography, law, astronomy, history, mining, and grammar. He mentioned men in connection with each of these specialties who made epoch-making contributions at about the same time that the medical Hippocrates was giving his ideas to the world.

The other Hippocrates was a great mathematician, who lived at practically the same time and near the island of Cos, where the medical Hippocrates is supposed to have had his school and hospital. The second Hippocrates is usually spoken of as "Hippocrates of Chios" to distinguish him from the better known medical man. Dr. Sarton explained his work in mathematics in relation to the Pythagorean school, which preceded him.

Dr. Fred B. Lund also laid emphasis on the extraordinary intellectual activity of this century in all branches of science, learning, and art.

THE CRAWFORD W. LONG MEMORIAL

THE Crawford W. Long Memorial Association has been at work for several years raising money with which to create a memorial to this Georgia physician who claimed to be the original discoverer of Ether Anesthesia. A statue of Dr. Long will be unveiled in Statuary Hall of the National Capitol in Washington, D. C., March 30, 1926. Invitations to the exercises have been issued. The program is as follows:

Program of the unveiling of the statue of Crawford Williamson Long, of Georgia, (1815-1878) the Discoverer of Ether Anesthesia, in Statuary Hall, National Capitol, Washington, D. C., March 30th, 1926, at 3 P. M., the Eighty-fourth Anniversary of the Discovery, March 30th, 1842.

Presented by the Crawford W. Long Memorial Association.

Statue of Georgia marble. Pedestal and other donations from Georgia Marble Company. John Massey Rhind, sculptor; James K. Watt, carver.

PROGRAM

Frank K. Boland, President Long Memorial Association, presiding.

1. Address by Joseph Jacobs, Ph.M., Sc.D., for the pharmaceutical profession, friend and former employee of Crawford W. Long.

2. Unveiling of the statue by the daughters of Crawford Long, Mrs. Frances Long Taylor and Miss Emma Long.

3. Presentation of the statue to the State of Georgia by Richard B. Russell, Chief Justice, Supreme Court, State of Georgia, and President of the Board of Trustees of the University of Georgia, from which Dr. Long graduated A.M., in 1835.

4. Presentation of the statue to the United States of America by Clifford Walker, Governor of Georgia.

5. Acceptance of the statue by Senator W. J. Harris of Georgia.

6. Address by Hugh H. Young, M.D., Johns Hopkins Hospital, for the medical profession of America.

7. Address by Senator George Wharton Pepper, of Pennsylvania, representing the University of Pennsylvania, from which Dr. Long graduated M.D., in 1839.

8. Response by L. G. Hardman, M.D., for the Medical Association of Georgia.

9. Response by Rebecca Latimer Felton, former United States Senator from Georgia.

10. Response by William Hamilton Long, M.D., Secretary Southern Association of Anesthesists.

11. Response by Miss Virginia Gibbes, representing the nursing profession.

NOTICE

ALBERT PFEIFFER, M.D., Director Division of Social Hygiene, A.A. Surgeon, has called attention to the annual meeting of the Medical Society of the State of New York which takes place March 30, 31 and April 1, 1926, with the suggestion that Boston physicians may be interested in the Special Demonstration on Syphilis, Thursday morning, April 1, in the ballroom of the Waldorf-Astoria.

Physicians outside of New York are cordially invited to attend all of the meetings.

SOCIETY MEETINGS

DISTRICT MEDICAL SOCIETIES

Essex South District Medical Society

Thursday, May 6—Censors meet at Salem Hospital, 3:30 P. M Tuesday, May 11—The Tavern, Gloucester. Annual meeting Speaker to be announced.

Essex North District Medical Society

May 12, 1926—The annual meeting at the Anna Jaques Hospital, Newburyport.

Middlesex East District Society

April 14—At the Harvard Club at 6:30 P. M. Address by Dr. William E. Ladd; subject, "Kidney Affections in Childhood."

May—Annual meeting, Colonial Inn, North Reading. Subject and speaker to be announced.

Suffolk District Medical Society

March 31—At 8:15 P. M. Medical Section. "Some Experiments in Group Physical Examination," Dr. Roger I. Lee.

April 28—At 8:15 P. M. Annual meeting. Election of officers. "Some Diagnostic, Prognostic and Therapeutic Aspects of Disorders of the Blood." Drs. George R. Minot, Cyrus C. Sturgis and Raphael Isaacs.

Notices of meetings must reach the JOURNAL office on the Friday preceding the date of issue in which they are to appear

BOOK REVIEWS

Modern Medicine, Its Theory and Practice. Edited by SIR WILLIAM OSLER, Bart., M.D., F.R.S. Third Edition, Thoroughly Revised. Re-edited by THOMAS MCCRAE, M.D., Assisted by ELMER H. FUNK, M.D. Vol. I. Bacterial Disease—Non Bacterial Fungus Infections—The Mycoses. Lea and Febiger, Philadelphia and New York, 1925.

This volume is the first of the third edition of Osler's famous "System." Dr. McCrae in his preface points out that since the publication of the first volume of the second edition many changes have occurred in our knowledge of the infectious diseases, notably in that of scarlet fever, epidemic encephalitis, influenza and tuberculosis. Ten contributors to the second edition of the System are no longer living—Sir William Osler, John H. Musser, James Carroll, W. P. Dunbar, Isadore Dyer, John H. McCollum, M. Herzog, A. O. J. Kelly, John McCrae and E. E. Southard.

In some instances their names have been retained, especially when the articles contributed by them were marked by special features. The name of Sir William Osler is kept at the head of the articles contributed by him. The introduction to the first edition written by Dr. Osler in 1907 and entitled "The Evolution of Internal Medicine" is reprinted. Chapter I, an introduction to the study of infectious diseases, is written by Ludvig Hektoen. Dr. McCrae contributes the chapter on typhoid fever, James M. Anders the articles on tetanus and erysipelas, George W. McCoy the ones on leprosy, plague and Asiatic Cholera, Frederick T. Lord the chapter on influenza, George W. Norris and David L. Farley the one on lobar pneumonia, Lawrason Brown, Allen K. Krause and Edward R. Baldwin the articles on tuberculosis, Francis G. Blake the one on septicaemia, W. W. Herrick the chapter on meningitis, M. P. Ravenel the one on anthrax and glanders, John Ruhräh the one on whooping cough, Rufus Cole the chapter on gonococcus infections, F. C. McLean the one on bacillary dysentery, E. F. Buzzard the one on poliomyelitis, and Elmer H. Funk the article on tularenica. The chapter on undulant fever is by Sir David Bruce, revised by George C. Low. The article on diphtheria by John H. McCollom and Edwin H. Place is revised by Dr. McCrae, and the chapter on scarlet fever by the same authors is revised by Dr. Funk. The final chapter on the non-bacterial fungus infections and the mycoses is contributed by James H. Wright. Throughout the work the editors and contributors have sought to keep in mind Dr. Osler's idea of what a System article should be—a discussion of a subject between the brevity necessary in a text-book and the

extensive consideration possible in a monograph.

The Internal Secretions of the Sex Glands. The Problem of the "Puberty Gland". By ALEXANDER LIPSCHUTZ, M.D., Prof. of Physiology in Dorpat University (Estonia), formerly Privatdocent of Physiology in Berne University (Switzerland). With a preface by F. H. A. MARSHALL, F.R.S., Author of the Physiology of Reproduction. 513 pp. illustrated. W. Heffer & Sons, Ltd., Cambridge, England. Williams & Wilkins Company, Baltimore, Maryland, 1924.

In this book there is a complete discussion of the action of sex glands upon the organism. The subject is very fully taken up and discussed, in fact rather too fully, as the book could have been expressed in far shorter space. This is probably due to the fact that Prof. Lipschutz himself wrote the English, and while he has done this well, still it is occasionally difficult to understand his meaning, and throughout the book his expression is verbose. The subject, however, is a most difficult one and he is quite conservative in his interpretation of work, much of which is hard to evaluate. The summaries at the end of the chapters and the long bibliographies are all of great value. The book is really a second edition of one which appeared in 1919, but it contains many changes in facts and in view point from this earlier edition. For instance, now Dr. Lipschutz believes that the "all or none" law works in regard to the hormonic action of the sex glands just as it does for muscles. Such interesting view points and the excellent summarizing of a very difficult and important subject, make this book an important one for all interested in internal secretions.

A Laboratory Manual of Physiological Chemistry. By ELBERT REED ROCKWOOD, M.D., PhD., Prof. of Chemistry and Toxicology in the University of Iowa; Author of an Introduction to Chemical Analysis for Students of Medicine, Pharmacy and Dentistry, and PAUL REED ROCKWOOD, M.D., Fellow in Medicine, The Mayo Foundation. Fifth edition, illustrated, 410 pages, F. A. Davis Co. Philadelphia, 1924.

This is a satisfactory text book, of its type, for the students of physiological chemistry, in which the teaching is developed by exposition of the subject, followed by experiments to develop the subject, and then by questions for the student to answer. This type of book largely reduces the amount of lecturing necessary for the student who uses it, and it also develops many interesting questions which make the student think. It is well organized, and interestingly gotten together, and would make a satisfactory text book.

Practice of Surgery. By DR. O. NORDMANN, Berlin. Berlin and Vienna: Urban and Schwarzenberg, 1925.

The two previous editions of this work, in 1915 and 1919, have been favorably reviewed in the JOURNAL. This third edition is completely revised and considerably enlarged by the addition of sections on special surgery. These, however, do not claim completeness, and the book is essentially a work on general surgery. It is illustrated with 511 cuts, some of them colored.

Surgical Operative Technic. By DR. FRIEDRICH PELS LEUSDEN, Griefswald. Berlin and Vienna: Urban and Schwarzenberg, 1925.

Previous editions of Pels Leusden's standard work on surgical operative technic for students and practitioners have been favorably reviewed in the JOURNAL. This fourth, new and notably improved edition, introduces the progress which has been made since the first in 1910. The book is copiously illustrated with 771 cuts in the text, and is a worthy contribution to the literature of general operative surgery. It does not include the special surgery of the eye, ear, nose, throat, or the female genital tract.

Modern Diagnosis and Treatment of Syphilis, Chancroid, and Gonorrhoea. By L. W. HARRISON, D.S.O., M.B., Ch.B., M.R.C.P.E., Brevet-Col. R.A.M.C. and K.H.P. (Ret.), Director of the Venereal Disease Department, St. Thomas Hospital. Published by Paul B. Hoeber, Inc., New York. Price $3.50.

The purpose of the book is to provide general practitioners with a short and concise up-to-date account of the present methods of diagnosis and treatment of syphilis, chancroid and gonorrhoea. With that end in view the book is excellently written. The ordinary laboratory methods of diagnosis are taken up in sufficient detail, but without unnecessary elaboration. The clinical diagnosis is taken up first in general, later by systems. A fair chapter is devoted to congenital syphilis. Treatment is taken up with as great simplicity as the subject allows. A short chapter is devoted to chancroid, two to gonorrhoea in men and one to the same disease in women.

Development of Our Knowledge of Tuberculosis. By LAWRENCE F. FLICK, M.D., LL.D.

This book is a large volume of nearly 800 pages in which the development of our knowledge of tuberculosis from its very earliest sources up to the present time is considered in

the greatest of detail. There are long and elaborate quotations from rare and unusual sources and the whole volume represents an enormous amount of careful, painstaking and patient investigation. It may well be regarded as the last word concerning our knowledge of the history of this disease.

While it is a book which only those who have time and an absorbing interest in things of the past will read through from cover to cover, nevertheless, it is a mine of useful and important information concerning any particular point on the subject which may be desired. It is a welcome addition to the library of any physician.

The Chemical and Physiological Properties of the Internal Secretions. By E. C. DODDS, Ph.D., B.Sc., M.B., B.S., Prof. of Biochemistry in the University of London Bland-Sutton Institute of Pathology, Middlesex Hospital, and F. DICKENS, M.A., Ph.D., Assistant in Biochemistry, Biochemical Department Bland-Sutton Institute of Pathology. 214 pp. Humphrey Milford—Oxford University Press. 1925.

This little book of 214 pages summarizes very well the chemistry of the internal secretions and very briefly takes up the physiology of their action. It is a book which is badly needed as it is extremely different to keep up with this subject, in which knowledge is developing so rapidly. It is, therefore, highly desirable to have a summary of all the knowledge to date, particularly when it is accompanied, as here, with so satisfactory a bibliography. As a result we now have the whole subject brought up to 1925, which is a very great help to anyone interested in the subject. The book is very well written and adequately states the chemical methods of producing the various active principles of the internal secretions which are now known. The physiological action of these extracts, however, are not very thoroughly taken up. The reviewer wished that more criticism had been indulged in by the authors. This would help the reader to more accurately differentiate the important pieces of work and while criticism need not be accepted by anyone thoroughly investigating the subject, it always greatly helps the casual reader.

This book is highly recommended to one who is interested in our present fundamental knowledge of internal secretions. It is well written, well conceived and the subject very satisfactorily handled. It stands out among the best in the recent books on this difficult subject.

Intravenous Therapy. Its Application in the Modern Practice of Medicine. By WALTON FOREST DUTTON, M.D. Second Revised and Enlarged Edition. F. A. Davis Co., Philadelphia, 1925.

This is the second edition of Dutton's popular manual of intravenous therapy. The book has been re-arranged and largely re-written. Much has been added, including considerable material which has never before appeared in print. The first chapter is an historical outline of intravenous treatment as practiced from ancient times to the present day Successful intravenous therapy, says the author, demands knowledge of bio-chemistry and mastery of technic on the part of the physician. He must know absolutely the physiological and therapeutic effect of the drug he is using. This form of administration, properly carried out, always assures accuracy of dosage and maximum potency in a minimum of time. The author describes in detail the technic of venesection, of saline infusion and of intravenous injection, with special instructions on the administration of arsenicals. Five chapters are devoted to blood transfusion, the advantages and disadvantages of the various methods being discussed at length. The first part of the book concludes with a short chapter on intravenous anaesthesia. In the second part are considered in alphabetical order a long list of affections in which intravenous medication may be used. Many of the remedial measures described are new and their value not yet established, the author's idea being to enable the profession to give them all a fair trial. A short appendix contains very convenient dose tables. This new edition of Dutton's handbook will doubtless prove to be even more popular than its predecessor.

Diseases of Infants and Children. By HENRY DWIGHT CHAPIN, A.M., M.D., and LAWRENCE THOMAS ROYSTER, M.D. Fifth Revised Edition. New York. William Wood and Company, 1925.

The idea of this text book, as stated by the authors in their preface, is that every branch of medicine should be written in as compact a form as is consistent with thorough presentation. This idea has been adhered to and the result is a very complete volume for ready reference in which most of the subjects have been brought well up-to-date and still are dealt with in a satisfactorily brief form. As with most medical text books, or so at least it would seem in this age of therapeutic nihilism, too many drugs are enumerated Valuable therapeutic measures of other types, however, are also included, such as the various forms of hydrotherapy, and aerotherapy.

Of especial interest is the description of Dr. Chapin's Speedwell Plan for the care of dependent infants; the grouping of well selected and thoroughly supervised homes to replace institutional care. The general impression of the book is impaired by faulty proof reading.